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THE CAUSES AND CONSEQUENCES OF EDUCATION-JOB MISMATCH
A STUDY OF UNDEREMPLOYMENT
AMONG CANADIAN UNIVERSITY GRADUATES, 1985-87

BY

©

LINDSAY REDPATH

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY

DEPARTMENT OF SOCIOLOGY

Edmonton, Alberta
FALL 1991

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L Redpath

11531 - 72 Avenue
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UNIVERSITY OF ALBERTA

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled THE CAUSES AND CONSEQUENCES OF EDUCATION-JOB MISMATCH. A STUDY OF UNDEREMPLOYMENT AMONG CANADIAN UNIVERSITY GRADUATES, 1985-87 submitted by LINDSAY REDPATH in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Dr. H. J. Krahn
Supervisor

Dr. G. S. Lowe

Dr. R. Pannu

Edward G. Fisher
Dr. E.G. Fisher

William O. Johnston
Dr. W. Johnston

Dr. L. R. Marsden
External Examiner

September 16, 1991

ABSTRACT

Mismatched underemployment, where levels of educational attainment exceed occupational requirements, is more than a useful indicator of the changing quality of employment in advanced industrial societies. It is a valid sociological concept highly relevant to key debates about social inequality and labour market processes. This study begins with a broad discussion of the theoretical, methodological and policy issues related to education-job mismatch. It then proceeds to an indepth quantitative analysis of mismatch using longitudinal data on a group of 1985 Canadian university graduates with bachelor degrees. The study finds that over one-third of these graduates were in jobs not requiring a degree two years after entering the labour market. As expected, Arts graduates had the highest rate of mismatch, while few graduates from Education or Engineering were mismatched. Business graduates were no more likely to be matched than the average graduate whereas Science graduates were at a considerably higher risk. These general findings seem to suggest that human capital theory provides an adequate explanation of mismatch. More detailed analysis, however, indicates that the education-job matching process is more complex and less equitable than human capital theory implies. A segmented labour market approach, emphasizing the dynamics between structural and individual variants of mismatch is a more useful theoretical model. In

conclusion, this study raises perplexing questions about the supposed shortage of skilled workers in a labour market which fails to adequately employ many young graduates.

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CHAPTER I. INTRODUCTION

> "As demand for educated people falls behind supply, as occupations are divided and rationalized, as enrollments continue to rise, the income and prestige differences between the more-educated and the less-educated masses decrease. Among those who are not allowed to use the educated skills they have acquired, boredom increases, hope for success collapses into disappointment, and the sacrifices that don't pay off lead to disillusionment (Mills, 1956:271-2).

This is a study of mismatch between educational and occupational attainment among a group of Canadian university graduates who entered the labour market in 1985. The problem is that over one-third of these young people were in jobs which did not require the level of education they had achieved, two years after they joined the labour force with bachelor's degrees in hand. These graduates were underemployed in the sense that the jobs they occupied do not normally require a university degree.

The concept of mismatched underemployment, used to describe this phenomenon, arose from a need to capture qualitative differences in employment outcomes in addition to monitoring unemployment rates. One of the objectives of this study is to explain not only why it is important to have valid indicators of mismatched underemployment but, also why this phenomenon is vitally relevant to sociological theory and research. The overriding theme is that mismatched underemployment, and the issues surrounding the causes and consequences of this problem, are central to debates about the role of the labour market in creating inequality. These debates also have immediate policy implications for governments, educators and employers, particularly in light of recent concerns about skill shortages (Canadian Chamber of Commerce, 1988; Canada, 1989; O.E.C.D., 1989).

The fundamental sociological question implicit in research on education-job mismatch is, "Who gets access to preferred jobs and why?" A second important theoretical question is, "Does our education system provide the individual with a relatively equitable means for realizing human potential and social mobility?" In other words, are job rewards for those with the same level of education reasonably equitable, and to what extent do we utilize the skills and abilities of those with higher education credentials? These questions are particularly relevant to the North American labour market where strong emphasis has been placed on higher educational attainment as a means to greater social rewards such as higher income, status and better quality of life.

Underlying the principle of meritocracy in educational and occupational attainment is the notion of technical rationality in matching individuals to jobs. Specifically, to what extent do education credentials signal a match between individual skills and abilities (or human capital) and technical job skill requirements? Sociologists in the conflict or Neo-Weberian tradition have argued that education credentials are often used as a means of social closure on the basis of class, race, or gender (Parkin, 1979; Collins, 1979; Bowles and Gintes, 1976).

Part of the difficulty in studying mismatched underemployment is that we know little about the nature of skill and how to define it. It has been said that skills reside in both the worker and the job and that individual performance contributes to the way skills are utilized by organizations (Spenner, 1988; O'Brien, 1986). There are also profound social biases (gender) and power relationships (unions, professional organizations) affecting the way skills are valued and rewarded in society (Livingstone, 1987). In short, job skill requirements are not strictly determined by the nature of the tasks to be done or the technology used to perform different tasks.

Early sociological theorists such as Marx, Durkheim and Weber recognized that the larger social and economic structure has a tremendous impact on how the knowledge and skills of workers are utilized and rewarded. Contemporary theorists continue to grapple with this issue. The deskilling thesis, put forward by Braverman (1974), suggests that the development of capitalism and increasing control over the labour process, will inevitably lead to greater unemployment and underemployment of workers. Even the more highly skilled technical, professional and managerial jobs, he says, are not immune from deskilling.

At the other extreme, post-industrial theorists (Bell, 1973) and advocates of the information society (Naisbitt and Aburdene, 1990; Drucker, 1990) tell us that highly educated workers ("knowledge" workers) will be in greater demand as new technologies create opportunities for them to use their knowledge and skills. Some jobs may be eliminated through the advance of technology and the rationalization of the workplace, they say, but this will be offset by employment growth and the demand for skills in other areas.

The alternative to these arguments, however, suggests there may be a polarization of job skill requirements with fewer opportunities in the middle-range (Myles, 1988). Though some jobs now require higher technical knowledge and proficiency than they did two or three decades ago, a substantial amount of deskilling has occurred leading to a greater disparity in skill differentials.

Any of the above scenarios would have a profound effect on labour market opportunities for university graduates, particularly in view of rising levels of educational attainment in North America. Demand for university education continues to grow as more and more young people view it as a ticket to a better job. In 1986, 9.6% of Canadians had a university degree, twice the percentage of graduates reported in 1971. Among the 25-44 age group, 15% had a university degree, while 37% had gone on for some type of post-secondary education (Canada, 1988a). While the youth population is declining, increasing proportions of young people are going on for higher education.

Overall, university graduates fare better than those with a high school diploma as human capital and status attainment models suggest (Becker, 1964; Boyd et al., 1986). Yet if there are increasing proportions of labour market entrants with degrees, fewer middle level managerial and professional jobs, and a tendency for employers to upgrade educational qualifications, the labour market for university graduates will become much more highly stratified. Furthermore, with university graduates at the head of the job queue, those with less schooling may be unable to gain access to some of the higher status sales, clerical and administrative and semi-professional jobs they aspire to.

The policy implications of education-job mismatch are far reaching. First of all, evidence of underemployment among university graduates seems to contradict claims about existing or impending skill shortages. In Canada, there seems to be a gap between the kinds of skills employers say they need and the kind of work graduates are able to find. Employers are complaining about a lack of technical and scientific expertise (Edmonton Journal, May 8, 1990; Canadian Chamber of Commerce, 1988). Meanwhile, Science graduates are unable to find work in their field of study (Edmonton Journal, January 24, 1989).

Part of the problem is that Canadian employers rely too heavily on the formal education system to prepare workers for employment. They invest little in on-the-job training compared to other industrial nations (Musynski and Wolfe, 1989:251; Canada, 1989:22). Thus, when employers express indignation about skill shortages and mismatch they, in turn, are open to criticism for failing to adequately train and develop existing human resources.

Secondly, mismatch has major implications for educators, particularly in relation to the continuing dilemma over what kind of programs universities should offer. There are obvious benefits to offering professional degrees in teaching, engineering or accounting, although universities are not the only institutions capable of providing such training. However, general skills in critical analysis, and written and verbal communication (Evers et al., 1991) are also valued by employers. This study will show that a considerable number of Arts and Science graduates are hired for jobs in marketing, sales, finance and administration. These are similar to jobs occupied by Business graduates. Thus, greater flexibility and balance between specific and general knowledge courses is likely to be more advantageous to graduates.

Research on changing job skill requirements supports the need for educational programming to promote general skills development rather than greater specialization and vocationalization (Spenner, 1988:171-72). From an organizational perspective, technical knowledge can quickly become outdated. Hence, continuing education and retraining are essential for adapting to technological change (Spenner, 1988; Musynski and Wolfe, 1989; Canada, 1989:19-22; Report on Business Magazine, 1991:46-51).

Employment equity is a third policy area relevant to educational-job mismatch. Previous research indicates that women graduates are generally no more likely to be mismatched compared to men. However, gender segregation is glaringly evident in the educational and occupational aspirations of university students. This partly explains why female graduates are paid less than male graduates. Engineering may reduce this pay discrepancy but other gender barriers remain (Wannell, 1990). Women Arts graduates, as this study will reveal, tend to be hired for low-level clerical and sales jobs and are consequently mismatched much more severely compared to their male counterparts. There is evidence to suggest, then, that employers continue to evaluate males and females inequitably when matching education credentials and job requirements.

These larger theoretical and policy issues will be fully explored in this study. The conceptual complexity of mismatch and necessity to view the problem over the long-term make it difficult to specify and operationalize a theory of underemployment. However, this need not impede progress toward a stronger theoretical integration between studies of underemployment and changing industrial structures, labour processes and occupational task requirements. Institutional and organizational levels of analysis must also be pursued since education job mismatch is greatly influenced by education policy, occupational specialization, and by recruitment, selection and labour utilization practices at the level of firms and industries. From a psychological perspective, educational and occupational decision making, attitudes and expectations of school and work, and job evaluation processes are relevant to subjective perceptions of mismatch.

The analytical framework used in this study is informed by a broad theoretical approach which accentuates the dynamics between labour market processes and the demographic, economic and social structures which influence them (Granovetter and Tilley, 1988; Baron and Bielby, 1980; Fisher and Robb, 1991). In short, it takes a wider scope in identifying the causes and consequences of education-job mismatch considering the impact of both individual and structural variables.

Chapter 11 begins with a brief description of this analytical framework followed by an in-depth theoretical discussion of the sociological significance of mismatch. The main thrust of this research, however, is a quantitative analysis of mismatch focussing on a group of Canadian university graduates who embarked on their careers in 1985.

Graduates of the mid-1980s are a unique but relatively unstudied cohort. They entered the labour market at a time when economic, technological and demographic circumstances were changed from what they were during the 1970s and early 1980s when most of the major studies of underemployment were conducted. At the tail end of the baby boom generation, these graduates were competing with fewer numbers of their peers for available jobs. Yet, as results from this study indicate, a considerable proportion of them were mismatched regardless of the local labour market conditions where they worked. Education-job mismatch, this thesis argues, is a valid, persistent concern and not merely a passing phenomenon.

Comparing matched and mismatched graduates a number of theoretical and methodological questions are examined. Do estimates of mismatch vary significantly when different types of measures are used? What variables influence matching outcomes for graduates with the same level of educational attainment? To what extent and how is stratification occurring on the basis of the type of degree acquired by university graduates? And finally, what are the social and individual consequences of mismatched underemployment for graduates with this level of educational attainment? The three major research questions are: 1) What is the extent of mismatch among university graduates in this study? 2) Which graduates were most likely to be mismatched and why? 3) What were the consequences of being a mismatched graduate?

Prior to conducting the empirical analysis, it was necessary to deal with the problems of measurement discussed in the literature on underemployment. Chapter III explains why underemployment, particulary mismatch, is difficult to define and measure. Reviewing the various methods of measuring this concept, it is obvious there are advantages and disadvantages to each, depending on the type of research questions being pursued. Certainly, there is no substantive evidence that subjective measures are any less valid than other types of measures. What is lacking, however, is a standard measure based on actual job skill requirements rather than employer hiring standards or subjective perceptions of the match between education and occupation.

Chapter IV reviews the existing empirical research on educational-occupational mismatch in North America. It summarizes what is already known about this problem and identifies the gaps and inconsistencies in research findings. From a theoretical perspective, it critiques the demographic, or cyclical argument that mismatch is the result of an oversupply of graduates entering the labour market during a period of slow economic growth.

Chapter V describes the data base used in this study and identifies specific research questions and hypotheses to be addressed. Existing panel data from the Study of Transition from School to Work, a major survey of 1985 high school and university graduates in Edmonton and Toronto (Krahn, 1988; Krahn and Lowe, 1990; Krahn and Lowe, 1991), allows for a two year assessment of education-job match outcomes. Although a longer term period would be preferable, this study indicates that most graduates who do not return to school have entered a definite career path two years after leaving university. Hence, two years is a reasonable length of time for assessing labour market outcomes.

Chapters VI and VII present the detailed data analysis while Chapter VIII summarizes and discusses these results in relation to the research questions and hypotheses set out in Chapter IV. This final chapter comments on the implications of these research findings with reference to some of the broader theoretical and policy issues discussed in Chapter II. In sum, this study will contribute toward a better understanding of mismatched underemployment from a theoretical, methodological, empirical and policy point of view.

CHAPTER II. THE SIGNIFICANCE OF MISMATCHED UNDEREMPLOYMENT IN SOCIOLOGICAL THEORY

Introduction

This thesis contends that the problem of education-job mismatch is vitally important to debates about changing technology and economic structures, as well as inequality in labour market outcomes. Others have argued, however, that this problem merits less attention than it has received. Herbert Smith (1986), for instance, claims that there has been a "misapprehension" of the consequences of education-job mismatch stemming from "an overemphasis on the traditional role of higher education in both economic production and occupational attainment."

Certainly, the role of education needs to be considered in the context of other social and economic processes influencing labour market outcomes. However, if anything, educational attainment has become increasingly more significant as a determinant in economic production and occupational attainment (O.E.C.D., 1989:47-49; Grabb, 1988:5).

As the following literature review emphasizes, the relationship between economic structure, educational attainment and employment outcomes is a recurrent theme in sociological theory and one that is far from resolved. The link between education systems and the labour market is a dynamic one. Long-term transformation of industrial structures, labour processes and occupational task requirements, coupled with major changes in the composition of the work force and rising levels of educational attainment, have complicated the person-job matching process. Underemployment, then must be viewed in the context of the larger social structure, more specifically as a "byproduct of the social organization of work" (Sullivan, 1978:12). Furthermore, there must be continuous monitoring of both quantitative and qualitative differences in labour market outcomes for graduates with different kinds and levels of educational attainment.

Toward a Model of Education-Job Matching

Following the general analytical approach of Granovetter and Tilley (1988:14) mismatched underemployment may be viewed as part of the myriad of structure, processes and actors influencing inequality in labour market outcomes. Figure 1 attempts to incorporate these elements into a broader analytical framework for the study of education-job mismatch among university graduates.[1] For instance, individual educational and occupational aspirations are constrained by funding and educational policy decision at the political and institutional level. They are also affected by standards of entry set by professional organizations such as those governing the teaching and engineering occupations. The availability of accurate labour market information and career counselling also influence individual educational and occupational choices.

---

[1] This model is similar to the constrained decision making model used in the analysis of industrial relations (Fisher and Robb, 1991), although the later has more of a management focus.

Once graduates enter the labour market, opportunities for matching are limited by the demand for jobs requiring higher educational qualifications, employer recruitment and selection practices, and internal labour markets which encourage promotion and development from within the firm. The structure of the labour market, at a local, national and international level, also places constraints on the types of jobs open to new graduates. Whereas previous cohorts found professional and managerial jobs in primary resources, manufacturing and the public sector, graduates of the 80s and 90s will be largely employed in the expanding services sector (Krahn and Lowe, 1990a).

Even after they have been hired into jobs requiring a degree, graduates may find their skills and abilities underutilized due to organizational hierarchy and traditional management styles. More importantly, women graduates will face barriers to entering certain types of jobs which have been traditionally occupied by males. Finally, graduates may have difficulty competing for jobs commensurate with their level of education simply because there are so many other young people with similar credentials.

FIGURE 1

Analytical Framework for Studying Educational Job Mismatch

LEVEL/UNIT OF ANALYSIS	ACTORS	PROCESSES	OUTCOMES	CONSEQUENCES
SOCIETAL Economy - Capital, labour, & gov't Society - Structure & composition - Values & norms Technology	Legislators Bureaucrats Industry & Union Leaders Educators Professionals	Investment in technology Industrial development Funding for education/ education policy Funding & policies for employment development	Supply & demand for labour (quantity & quality) Levels of educational attainment. Job skill requirements.	Political dissent/ disenchantment
INSTITUTIONAL Industry Labour Markets Education Systems		Educational programming Collective bargaining-professional credentials External & internal labour markets	Barriers to occupational entry (gender, ethnicity, age, SES, credentials)	Collective action

ORGANIZATIONAL Work organizations	Managers Human Resource professionals Career counsellors	Application of technology to work Management of human resources - matching workers to jobs - training & development Career counselling	Utilization of skills & abilities	Worker productivity
INDIVIDUAL	Parents, Students Workers (Graduates) Tax payers	Individual decisions about educational and occupational aspirations Job searching	Graduate job and career expectations Individual educational & occupational attainment Employment status Adequately employed (Matched) ***Underemployed (Mismatched)** Unemployed	Earnings Job satisfaction Self esteem

SOURCES: Granovetter and Tilley (1988), Baron and Bielby (1980), Fisher and Robb (1991).

In essence, this analytical model provides a conceptual basis for examining the relative role of structural and individual factors (Baron and Bielby, 1980:761) in the education-job matching process. It is an approach which recognizes the complex, dynamic nature of labour market processes, and allows for explanations from various theoretical traditions to contribute to the analysis of mismatch.

This chapter examines mismatched underemployment in this larger theoretical context. It reviews themes from classical and contemporary sociological theory which are highly relevant to mismatch and discusses how different theories of the labour market view this problem. The connection between organizational structures, job design and matching people to jobs is also discussed. Each theoretical perspective emphasizes different levels of analysis, actors, processes and outcomes to account for mismatch. Throughout this review, it is evident that the relationship between education systems and the labour market is continually being re-examined in the context of changing social and economic structures. Thus, an analytical framework which incorporates both a macro and micro level of analysis provides a strong conceptual foundation for studying the causes and consequences of education-job mismatch.

Underemployment and Classical Sociological Theory

Sociological theory began as a critique of modern capitalism centred around the organization of production and the nature of work. Themes related to technological change, the skills and abilities of workers, lack of interesting, challenging work, and the role of education credentials in occupational attainment are present in the writings of Marx, Durkheim and Weber. To these classical theorists, unemployment and underemployment were symptomatic of larger social-structural problems.

Marx, for instance, predicted that capitalism's drive for increased productivity would result in the displacement of labour by technology and machinery leading to a growing 'reserve army' of unemployed and eventual breakdown of the economic and social system. He also envisioned a labour force of underemployed workers who would become the 'guardians of the machines' rather than the essential component of production. Lacking control over production processes and the reshaping of the physical environment, workers, and eventually all of humanity, would become increasingly alienated and subsumed by the very technology they created (Marx, 1978:278-284).

Hence, although he did not address the issue directly, Marx foresaw the potential for alienation and proletarianization of the educated worker -- an idea pursued in contemporary Marxist theory through concepts such as "deskilling", the "intellectual reserve army" (Braverman, 1974), the "new middle class" (Mallet, 1975) and the "technicization or intellectualization of work" (Gorz, 1967).

> "The full development of capital, then takes place....when fixed capital appears as a machine within the production process opposite labour; and the entire production process appears not subsumed under the direct skillfulness of the worker, but rather as the technological application of science" (Marx, 1978:281).

Durkheim saw the increasing division of labour and specialization of skills as a necessary and beneficial part of the growth and modernization of society. Education played a key role in preparing people for different occupational roles not only by providing specific technical skills, but by socialization processes (Durkheim, 1964:43). In Durkheim's view, occupational stratification was based on differences in individual skills and abilities, and the need for functional specialization to benefit society as a whole. Thus, exploitation did not occur providing there was a just and moral basis for the division of labour.

Much like Durkheim's earlier theory of the division of labour, the structural functionalism of the 1950s promoted the idea that specialization, differentiation and inequality were not only inevitable but beneficial to modern society (Grabb, 1990:114). Implicit in structural functional theory, as argued by Davis and Moore (1949), is an underlying technical rationality to the structural hierarchy of occupations. Skill requirements and job complexity are assumed to be technologically determined. Thus, occupations performing functions critical to society or requiring knowledge or skills in short supply are highly valued, ensuring that persons with the necessary ability are attracted to these jobs. The occupational hierarchy, then, reflects society's need for certain functions to be performed as well as differences in ability and motivation to learn and perform these functions. Durkheim expresses this functionalist perspective in the following quotation:

> "For if nothing impedes or unduly favors those who are disputing over tasks, it is inevitable that only those who are most apt at each kind of activity will indulge in it" (Durkheim, 1964:43).

Max Weber saw the division of labour and occupational specialization as part of an ongoing process of rationalization and bureaucratization of all aspects of society. While acknowledging the efficiency of bureaucracy as a form of social organization, Weber was acutely aware of its negative effects on individual interests and freedoms. Removed from the original utilitarian notion of greater efficiency for the sake of the 'common good', occupational specialization became a means of limiting access to certain types of jobs.

Pursuit of higher education or "degree hunting", as Weber referred to it, was a form of status seeking that effectively limited the supply of candidates for socially and economically advantageous positions

(Weber, 1978:998-1000). Increasing educational specialization had less to do with a rational need for technical efficiency or a moral basis for the division of labour, and more to do with the establishment and preservation of a privileged occupational strata for those possessing educational credentials. The notion of status groups, as distinct from classes, is central to his analysis of the role of education in society.

> "The role played in former days by the 'proof of ancestry', as a prerequisite for equality of birth, access to noble prebends and endowments and, wherever the nobility retained social power, for the qualifications to state offices, is nowadays taken by the patent of education" (Weber, 1978:1000).

Marx, Weber and Durkheim used the quantity and quality of employment as important indicators of the degree of social inequality in industrial societies. The link between education and the labour market, either implied or stated by these theorists, became increasingly more relevant with the expansion of formal education systems, the growing professionalization of occupations, and formalization of hiring standards in the twentieth century. The following section reviews contemporary sociological theory, seeking further contributions to the explanation of education-job mismatch.

Underemployment and Contemporary Sociological Theory

Education and Inequality

In Canada and the United States, as throughout the leading capitalist nations, education and occupational attainment are integrally linked (Fulton et al., 1982). Few societies have placed such strong emphasis on the role of formal education systems in preparing young people for labour market entry (Lowe and Ashton, forthcoming). The struggle for compulsory education at the turn of the century, for instance, was influenced by the need for skilled and disciplined workers during a period of rapid industrialization. Political democracy, combined with economic expansion, reinforced liberal ideals that education would be the great equalizer by reducing barriers to social and economic advancement (Berg, 1970:188; Squires, 1979:9-13; Murphy, 1979; Richer, 1988). Education was also a means of ensuring that citizens were capable of exercising their democratic rights and responsibilities (Squires, 1979:10; Rocher, 1979).[2] Thus, education became valued as both a private and public benefit.

During the 1960s, the democratization argument was advanced to justify massive expansion of post-secondary education systems in Canada. Even today, the role of our educational institutions is questioned in relation to the balance between private needs, such as the right to education and academic freedom, and public needs, such as the responsibility to provide the kind of skills and expertise required by employers (Canada, 1985; Wilkinson, 1986; Newson and Buchbinder, 1988;).

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[2] This is similar to Durkheim's notion of education as a means of moral or social development.

These issues are also related to the question of underemployment. With the fiscal crises in government spending, previous substantial levels of public investment in post-secondary education are in jeopardy. Will society be in a position to subsidize those who wish to pursue higher education for their own self-fulfilment? How are the benefits derived from public and private investment in higher education to be evaluated? To what extent has higher education led to increased social mobility if many university graduates are working in jobs which high school graduates could do? Will graduates begin to question the liberal egalitarian myth about equality in educational and occupational attainment?

It has been argued that Canada's education system has become less elitist and more achievement oriented largely due to increasing American influence since World War II (Murphy, 1979; Clark, 1976). In contrast to the British system of education, where occupational streaming occurs at an early age and access to better schools is more determined by class background, the American system of public education promotes the idea of equal schooling. Turner (1966) has described the difference between the two systems as one of contest mobility (equal opportunity and advancement through educational achievement) versus sponsored mobility (access to elite educational institutions and occupational entry based on social class). Regardless of how, when or why the Canadian system of education evolved, few would disagree that our society places a strong emphasis on the belief that a higher education provides access to a better job.

Marxist perspectives on the relationship between education and the labour market question the 'function' of education in terms of who has access to it and what sort of job-related skills are actually acquired through schooling. Bowles and Gintis (1976), for instance, challenge the "technocratic-meritocratic ideology" of structural functionalism by examining evidence on the relationship between academic ability, performance, and economic success. They argue that employers seek and reward educated labour for certain attitudes and behaviours compatible with work and authority structures, but not necessarily for specific cognitive or technically required skills. Education, according to Bowles and Gintis, serves to reproduce existing inequalities in the class structure of society, under the guise of meritocracy (Bowles and Gintis, 1976:102-3).

Canadian studies of the educational attainment also demonstrate how inequality of opportunity is built into the academic achievement process, and how seemingly voluntary choices are constrained by socio-economic background (Murphy, 1979; Guppy et al., 1988; Denton and Hunter, 1991). The contest mobility system, they argue, is not as fair and meritorious as it seems.

Credentialism

Others have assessed the relationship between education and labour markets from a conflict theoretical perspective (Parkin, 1979; Squires, 1979; Collins, 1979; Berg, 1970). Generally this theoretical approach draws on the Weberian notion of social closure, emphasizing the exclusionary effect educational credentials can have on opportunities for social and economic status attainment. Parkin, for example, described how the ability to access specialized knowledge and practice through educational certification has become yet another way to exercise power and domination over others. He defined 'credentialism' as: "the inflated use of educational certificates as a means of monitoring entry to key positions in the division of labour" (Parkin, 1979:54).

Collins (1979) further developed a theory of credentialism based on the concept of social closure. Barriers to employment or preferential job rewards are often determined by criteria unrelated to the skill requirements of jobs such as gender, ethnicity, social origins, religion and education credentials. Collins draws on a wide range of research to substantiate his claim that educational content has little to do with occupational requirements. Educational standards for entry into professional occupations, Collins explains, have no basis in technical expertise but evolved as a strategy to preserve higher status positions for the upper classes.

Colleges and universities have a vested interest in providing degrees leading to professional occupations, because creating a distinct path between formal education and higher status jobs ensures their own survival. The use of education in this way results in greater demand for higher education and the proliferation of credentials regardless of job requirements, availability of jobs or the diminishing rates of return brought on by an increased supply (Collins, 1979). Thus, the theory of credentialism may help explain why university graduates continue to be underemployed even when there are supposed skill shortages.

Status Attainment and Social Mobility

Another area of sociology which examines the education-occupation link is status attainment research (Blau and Duncan, 1967; Boyd et al., 1985). This literature attempts to isolate the effects of education on first or present job by controlling for other factors such as gender, ethnicity, parents' education and occupational status. Occupational status is typically measured by combining educational requirements with income and social prestige (Pineo and

Porter, 1967; Blishen and McRoberts, 1976). Working within this tradition, analysts of the 1973 Canadian Mobility Study data demonstrate education is by far the most important factor in determining occupational status, although gender and ethnicity still account for a great deal of inequality in employment outcomes (Boyd et al., 1985).

On the whole, the status attainment perspective supports the notion that higher education leads to a better job. University graduates are more likely to access higher status jobs than their peers with a high school education. At the same time, researchers report declining occupational status among university graduates (Harvey and Charner, 1975; Goyder, 1980; Harvey and Kalwa, 1983). There are suggestions that the trend of declining rates of return on higher education is independent of cyclical fluctuations in labour market conditions (Blakely and Harvey, 1988). Furthermore, there are wide ranging differences in employment outcomes among graduates with the same kind and level of education credential. Status attainment research does not normally address this issue.

Research outside of the traditional status attainment approach provides greater insight into the connection between education credentials and occupational status. For instance, Hunter's (1988) historical analysis of changing occupational skill requirements for entry-level positions found that formal schooling is quite clearly related to the different skill requirements of jobs and that its importance as a criterion for employment has increased over time (763). Although his data generally support the technical rationality argument, Hunter does not eliminate the credentialist thesis as a possible explanation of employer preferences. In fact, he observes a bias toward well-educated employees for any jobs not requiring motor-skills activity, regardless of other skill requirements (761). Hence, there is obviously a need to distinguish between trends in employer hiring practices and changes in actual job skill requirements.

Traditionally, sociologists have been interested in the relationship between education systems and the labour market as well as changing occupational skill requirements. Only recently, however, have research efforts been directed toward analyzing and measuring job skill requirements and skill utilization. Little is known about the relationship between job requirements and skills acquired through formal education.

The Deskilling Debate

Arguments about long-term changes in labour processes and the skill content of work are closely associated with the underemployment question, yet are not sufficiently dealt with in the literature. Is work becoming more or less complex in nature? Will we need fewer or more people to produce goods and services as industrialized societies become more technologically advanced? Critics such as Braverman (1974) and Edwards (1979) argue that technology is used to exert greater control over the labour process resulting in the gradual deskilling of work.

From this perspective, deskilling and presumably underemployment, are an inevitable result of the development of monopoly capitalism. Similarly, deindustrialization theorists argue that growth in service sector employment will create a mass of unskilled, low-paying, part-time jobs with few benefits and little security (Bluestone and Harrison, 1982). Some suggest this will result in a 'declining middle class' as fewer workers are able to access higher income and higher status jobs (Kuttner, 1983). Thus, fewer jobs would be available for those with higher education credentials.

On the other side of the argument, optimists such as Daniel Bell (1973) counter that technology creates an upgrading of skills. In Bell's post-industrial society, computers free human labour from the routine, manual work involved in the manufacture of goods, allowing it to be redirected toward the production of knowledge or information, thereby utilizing greater mental skills. Increased demand for cognitive skills ultimately provides jobs for a more highly educated, technically competent work force, resulting in expansion of the middle class and presumably less underemployment.

So far, aggregate empirical research has produced little evidence of long-term occupational deskilling nor has it confirmed the more optimistic predictions of the post-industrial thesis. At the aggregate level of analysis, it seems more likely that a trend toward modest upgrading of skills in certain industrial sectors has been offset by considerable downgrading in others, resulting in little net change in skill levels of work over the past 50 years (Spenner, 1983; Myles, 1988; Hunter, 1988). There is evidence, however, of increasing polarization in the distribution of job skill requirements within the service sector (Myles, 1988) and a relative decline in the proportion of middle-level skill jobs as a result of the general shift toward service sector employment (Economic Council of Canada, 1990:14). If this is so, educational barriers to higher level jobs may seriously limit labour market mobility for those without the appropriate level or kind of schooling.

It is becoming increasingly apparent that skill requirements are not determined by the inherent nature of the technology itself, as the technical rationality argument presumes. Rather, it depends on how technology is implemented as part of overall managerial strategy (Child, 1988). Seemingly a combination of manual, technical, and higher conceptual skills is required to accommodate new technology; however, it is difficult to predict what specific skills are necessary for different technological applications (Musynski and Wolfe, 1989). Furthermore, there is considerable disagreement about how skills are defined and to what extent they are socially constructed as opposed to objectively determined job skill requirements. For instance, the value of one set of skills over another is to a large extent negotiated according to the relative power of workers, employers and the state (Livingstone, 1987:3-8). Finally, little is known about what types of skills are acquired through formal education and how these skills relate to the performance of specific jobs tasks (O'Brien, 1986:36).

Underemployment, and the matching of educational credentials with job requirements, must be studied in the context of the larger debate about the effects of long-term economic and occupational structural change on the skill content of work. In North America, however, explanations of the education-job match rarely incorporate a long-term structural perspective.

Theories of the Labour Market and Underemployment

Human capital theory has been much criticized for its narrow interpretation of factors influencing supply and demand in the labour market. Often it fails to identify barriers to occupational entry and mobility and isolates the labour market from the broader social structure (a criticism which can be also be applied to status attainment and social mobility research). Yet for all its shortcomings, human capital theory provides the simplest explanation of how basic labour market mechanisms operate in capitalist society.

In the language of human capital theory, underemployment represents underutilization of human resources. Like structural functionalism, human capital theory proposes that the demand for certain education credentials is based on a need for specific skills. Individuals who invest in education and training to acquire such skills will have greater success in the labour market (Becker, 1964). Underemployment results when the supply of individuals possessing these skills exceeds demand. Thus the jobs requiring these skills are devalued and new entrants with previously marketable credentials find themselves unable to obtain jobs for which they trained.

Discouraged by the devaluation of these skills, fewer individuals will pursue the same education credentials and, as supply diminishes, declining wages stabilize at the point of marginal utility. This balancing-out concept means there will be periods of adjustment where supply and demand do not meet, causing serious problems for labour market participants caught in the squeeze.

The question is, are these merely short-term fluctuations in the demand-supply cycle or will requirements for skilled and educated labour decline due to fundamental restructuring of labour markets? Thus, the deskilling debate offers a useful critique of human capital theory and no matter which side of the argument is taken, the prevalence of mismatch is an important indicator of the gap between supply of skills and job requirements.

Despite declining returns to college graduates, enrolments in post-secondary education institutions have continued to grow rapidly (Statistics Canada, 1990:50). Seemingly, future labour market participants have not been deterred from pursuing educational credentials, calling to question the equilibrium predictions of human capital theory.

In an alternative explanation of underemployment or overeducation, Thurow's labour queuing theory (1975) suggests education acts as a signal of trainability rather than signifying specific skills acquisition. Employers, he says, use education as a screening factor in order to minimize training costs, particularly when job experience and performance records are not established (Thurow, 1975:86-88). Therefore, young people will continue to demand higher education, even though they contribute toward devaluation of these credentials, since they are relatively better off than those people without them. Both Thurow and

Collins (1979) are critical of the way employers use educational qualifications primarily as "a means of rationing economic privilege" rather than as a proxy for technologically or quantifiably determined skill requirements (Burris, V. 1983:455). From a psychological perspective, human capital theory assumes individuals are motivated to pursue educational credentials because they expect to gain social and economic rewards commensurate with their personal and public investments in higher education. This subjective notion of equity is particularly useful for studying differences in labour market outcomes for those with the same level of educational attainment. However, the focus on individual motivation minimizes the influence of social class, gender, and ethnicity on occupational expectations and aspirations.

Labour market segmentation theorists, on the other hand, recognize the importance of these variables in addition to structural determinants at the societal and institutional level of analysis. From a segmentation perspective, employment outcomes are not simply the aggregate result of individuals trying to maximize their interests within their own sphere of influence. The quantity and quality of labour market demand reflects the way production is organized in different sectors of the economy.

For instance, according to dual labour market theory, workers in the primary sector tend to have jobs of higher status with better rewards and greater job security no matter what market conditions prevail; whereas, the secondary labour market is characterized by low paying, low status jobs with little job security (Gordon, et al., 1982; Edwards, 1979). This structural inequality arises from the concentration of power in core sectors of the economy where large corporate employers are able to exercise some degree of control over product demand and labour market fluctuations (Ashton, 1986: 64-65). Workers in this sector benefit from internal labour market strategies which promote the retention, training and advancement of employees. Barriers to occupational entry and mobility, then, become institutionalized over time, despite cyclical changes in supply and demand.

Segmentation theorists also examine how worker attributes such as gender, ethnicity, socio-economic background and educational attainment vary systematically between sectors. Labour force dynamics, they say, are mediated by institutionalized inequality of opportunity, inequitable returns, and employer strategies designed to minimize instability of demand and supply factors (Clairmont, et al., 1983). This is similar to Thurow's critique of the marginal-productivity view of equity in economic theory (Thurow, 1975:43-50).

Whereas human capital theory implies that individuals who work hard to achieve the skills society values are rewarded through higher occupational status and pay, segmentation theory recognizes institutional barriers to occupational attainment which may have little to do with individual achievement and motivation. Similiarly, Thurow's explanation of job competition recognizes that ascribed characteristics, such as personality, gender, class background and natural ability often influence employers' perceptions of 'trainability' to a greater extent than job skill requirements or the supply and demand for labour (Hoskins et al., 1989). Underemployment, then, is an indicator of the degree of inequality in labour market opportunity. Furthermore, it may also measure the degree of segmentation or stratification itself for, as studies of underemployment suggest, segmentation may now be occurring on the basis of 'type' rather than 'level' of education as the proportion of the population with higher educational credentials increases. Labour queuing and segmentation theory both challenge the concepts of 'technical' and 'employer' rationality implied by human capital theory. Questioned are the assumptions that job requirements are based on the need to apply specific technologies and that employers match the skills and qualifications of job applicants primarily on the basis of technical job requirements (Jones, 1985).

Theories of the labour market, however, have been criticized for lacking an organizational perspective (Baron and Bielby, 1980; Baron, 1984). Although segmentation theory offers more of a structural orientation than competing theories, its contribution to the study of underemployment would be enhanced by better linkages with research on organization structures and human resource management.

Work Organizations and Underemployment

The theories reviewed to this point have, for the most part ignored the impact or organizational structure and behaviour on underemployment. At the level of the firm, key factors influencing organizational behaviour such as size, growth, changing technology, the demographic composition of the work force, and unionization have a tremendous impact on the distribution of occupational opportunities and rewards as well as the allocation of individuals to specific jobs (Baron, 1984).

Little is known, for instance, about employer selection practices or how jobs are matched with individual skills and abilities. In his study of underemployment, Berg (1970) questioned the rationality of employer hiring practices demonstrating that employees with higher education credentials are no more productive than those with less schooling. He suggested employers have vague perceptions about the relationship between level of education and job-related skills and rarely validate their screening criteria or selection techniques. There is evidence to support his contention. Research on the validity of common selection techniques, such as interviewing, suggests that employers are subject to numerous biases and rating errors (Arvey and Campion, 1982). According to a study of Canadian employers, education credentials merely signal general skills acquisition and training potential since specific skills are learned on the job (Bills, 1988). Another Canadian survey of both graduates and employers found that university graduates have adequate technical skills but often lack communication, interpersonal and leadership skills (Rush and Evers, 1986).

Interestingly, arts and social science graduates were rated as having a higher level of proficiency in these skills compared to engineering and business graduates (Rush and Evers, 1988:24). This may explain why some employers say they are looking seriously at the recruitment of liberal arts graduates over those with more technically oriented degrees (Bjorkquist, 1987). Yet employer recruitment strategies are geared toward hiring graduates with technical educational preparation even though many end up in jobs where general skills are more important. Do employers really know what they want?

Segmentation theorists say employer strategies differ depending on what type of labour is being recruited. However, a detailed study of manufacturing employers in Windsor, Ontario revealed personality factors were more important than job-related skills or educational qualifications in hiring both university and non-university educated employees (Singh and Crocker, 1988). The authors conclude that, contrary to professed recruitment practices, managers place more emphasis on matching attitudes and values against their own subjective criteria rather than matching the person to the job (180). Reliance on non-job related criteria may be even greater, where applicants with the same education credentials are competing for the same jobs.

The extent to which work structures and organizational factors provide opportunities for skills utilization is highly relevant to the issue of underemployment. The freedom to use one's knowledge, skills, and abilities on the job is a critical dimension in measuring job satisfaction (Kalleberg and Sorenson, 1973; Locke, 1976; Karasek, 1979; O'Brien, 1982), and quality of working life (Quinn and Staines, 1979; Burnstein et al., 1975).

Also relevant is research on the nature and content of work and its influence on attitudes toward work and job behaviour (Kohn and Schooler, 1983; Blackburn and Mann, 1979). Of particular interest to underemployment research are studies examining the effects of first job experience on long term careers (Blossfeld, 1987; Ornstein, 1976). Although little has been done in this area, there is some indication that those whose initial jobs entail low utilization of skills and minimal responsibility will not do as well as those whose first jobs are highly challenging (O'Brien, 1986:62-64). Similiarly, research on organizational entry and socialization refers to the importance of match between individual needs and job requirements (Wanous, 1980).

These findings are consistent with work motivation studies (Locke, 1976) demonstrating that higher goals tend to improve task performance and that greater complexity and autonomy are associated with more positive personality and career outcomes (Kohn and Schooler, 1983).

Designing jobs which make greater use of individual skills and abilities is at the heart of the quality of working life movement. It puts greater onus on employers to make better use of the human resources currently available in the labour market and partly explains why underemployment can occur at the same time as apparent skill shortages. At the organizational level of analysis researchers might examine how jobs could be designed to make optimal use of the skills and abilities of new graduates by improving on-the-job training and encouraging a development program which includes continuing education. Organizational cultures and decision making processes which favour age and experience over youth and new ideas also deserve greater attention. In sum, research on underemployment would benefit from stronger linkages with studies of organizational structure and behaviour (Sullivan, 1978:160).

Summary and Conclusion

To understand the significance and potential impact of mismatch underemployment, it is necessary to draw insights from a broad variety of theoretical perspectives. Classical theorists such as Marx, Durkheim and Weber observed, in the early stages of industrialization, the potential impact of technological and economic development on the nature of work and social equality. Their critiques of modern society gave rise to theories such as deskilling, structural-functionalism and social closure which place greater emphasis on the role of education in occupational attainment and the distribution of social and economic rewards. Thus, Smith's argument about overemphasizing the importance of education in economic production and labour market outcomes has little credence from a theoretical standpoint.

These larger theoretical issues are critical to the study of underemployment, but middle range theories of the labour market are more directly relevant to the education-job matching process. Weaknesses in existing theories, however, must be addressed. Human capital and labour queuing theory incorporate both structural and individual explanations of matching, but focus more specifically on the motivations and behaviours of employers and job seekers in response to supply and demand conditions. Labour queuing theory is more closely related to segmentation theory, however, in that it recognizes a structure of labour market opportunity based on both ascribed and achieved characteristics of workers (Hoskins et al., 1989:1-3). Thus, segmentation and labour queuing theorists both tend to be critical of the notion of equity and individual merit emphasized by human capital theory.

In addition, segmentation theorists usually provide the historical perspective (Gordon et al., 1982; Blossfeld, 1987; 1990) necessary for examining the effects of long-term social and economic change on labour market opportunities. There is a tendency for researchers in this tradition to combine economic and sociological theory at the societal and institutional level of analysis. For instance, Ashton et al., (1990) explain how globalization of product markets, the relocation of capital, technological innovations, and political ideology have changed the structure of youth labour markets in Britain. Research on underemployment would benefit from such a comprehensive, multidisciplinary analytical approach. Similiarly, the problem of underemployment deserves greater emphasis by segmentation theorists, particularly in studies of transitions from school to work.

Finally, research in organizational structures and management theory specifically related to person-job fit, skill utilization, job satisfaction and performance has tremendous potential to increase our knowledge of underemployment particularly from a psychological perspective. It also has direct implications for job redesign and improving the quality of working life. Unfortunately, this literature is seldom drawn into the mainstream of the underemployment debate.

In conclusion, the study of mismatch underemployment needs a stronger theoretical framework as well as further empirical analysis, but it is far from being a misplaced concern. The conceptual framework sketched out in Figure 1 indicates how various levels and units of analysis are relevant to the question of education-job matching and underemployment. Hence, theories from a variety of disciplines are useful in explaining the causes and consequences of mismatch from an individual and social perspective.

For this reason, this study neither proposes, nor tests a general theory about underemployment. As is typical for research on labour market outcomes, human capital theory is central to the analysis because it provides a generally accurate description of the job matching process, a clear set of testable hypotheses, and a functionalist, conservative theoretical orientation. However, human capital theory overlooks important socio-structural variables which explain how and why mismatched underemployment occurs. This thesis argues that the causes and consequences of education-job mismatch need to be examined in a much broader social and historical context, bringing this body of research up-to-date with current trends in labour market analysis.

The following chapter discusses some of the conceptual and measurement problems which plague research on underemployment. Some of these problems stem from a narrow theoretical interpretation of mismatch. Hence, it is hoped that the above discussion will contribute toward a better understanding of the difficulties researchers face in studying qualitative differences in labour market outcomes.

CHAPTER III. DEFINITION AND MEASUREMENT OF MISMATCH

Introduction

In advance of reviewing existing empirical evidence, it is useful to discuss how the concept of underemployment is operationalized. Described appropriately as "both conceptually and empirically elusive" (Glyde, 1977:246), underemployment can be a difficult term to define and measure. There is disagreement about the validity and merits of different types of measures, particularly where indicators of education-job mismatch are concerned. Furthermore, research in this area continues to be hampered by methodological imprecision in the measurement of skill. This chapter critiques existing measures of mismatch in order to facilitate the selection of appropriate indicators for this study.

Defining Mismatched Underemployment

The term underemployment refers to various types of employment that are marginal in relation to a socially defined norm of full employment (Sullivan, 1978). For instance, a person may be underemployed by virtue of working part-time rather than full-time or by receiving earnings that are below subsistence level; whereas, mismatched underemployment occurs when the job requires lower educational qualifications than those possessed by the worker. In Europe, low-hours underemployment is the major issue while in North America both involuntary part-time work and mismatched underemployment have received considerable attention. Hence, the critical problem for researchers lies in determining what standard of "full" or "adequate" employment will be used. This is particularly difficult when it comes to measuring mismatch between level of educational attainment and job skill requirements. There are the so-called objective measures which look at the degree of matching between level of formal schooling and the level of educational attainment usually required for a job or occupation. There are also subjective measures which ask workers to assess whether or not they are overqualified for the job they occupy considering their education and training. No matter which type of measure is used, controversy often arises over the question of how to measure skill.

Measuring Job Skills

Underemployment is an elusive concept largely because skill is so difficult to define. First of all, it is important to recognize the socially constructed aspects of skill and the way it is evaluated (Jones, 1980; Livingstone, 1987). For example, cognitive skills are given higher status than manual skills (Hunter and Manley, 1986), while research on the feminization of occupations (Lowe, 1987) has exposed deeply rooted gender biases in the way womens' work is valued compared to jobs typically performed by males. Furthermore, the role of professionalization in defining and restricting the use of job skills must also be acknowledged, as Parkin (1979) and Collins (1979) argue.

Social science is in the exploratory stages of identifying different dimensions of skill and new methodologies for measurement (Spenner, 1988:140-41). Human resource professionals have recently begun to try a behavioural approach to job analysis which focuses on identifying the specific behaviours or tasks performed by each worker (Stone and Meltz, 1988:351-54). Yet, while a worker may possess certain cognitive or manual skills, there are institutional (professional organizations, unions) and organizational (functional hierarchy, supervision) constraints on the ability to utilize those skills.

For example, interesting observations have been made about the changing nature of skill when historical transformations in occupational skill levels are assessed (Spenner, 1988:157-59). Some professional jobs which now require greater knowledge and task skill requirements score lower on the autonomy or control dimensions of skill than they did two or three decades ago, possibly due to the fact that more professionals are employed by large bureaucracies. In other words, the way work is organized or supervised can restrict or enhance the use of job skills. Accurate measurement of changing skill requirements is further complicated by shifts in the occupational composition of the labour market. For instance, the growth in managerial and professional jobs, particularly in the public sector, may account for an apparent trend towards skill upgrading over the past two decades (Myles, 1988).

In short, there is a need for researchers to devise valid and reliable measures of skills which take into account the these various societal, institutional, organizational and individual influences over the way they are evaluated. This would greatly improve our ability to measure mismatch between the skills acquired through formal education and job skill requirements. For now, it is important to recognize the strengths and weaknesses in the existing methods of measurement.

Measures of Mismatch

Research on underemployment has progressed using a variety of subjective and objective measures of mismatch. While subjective methods have been too readily dismissed as unreliable, objective methods often use indirect measures of skill, most commonly, level of educational attainment (Spenner, 1988:138-139).

The Labour Utilization Framework (L.U.F.)

Various categories of underemployment are fully described and distinguished from one another in the Labour Utilization Framework (L.U.F.). This framework was developed during the 1960s by Hauser (1974) for the initial purpose of measuring underutilization of labour in less developed countries. The L.U.F. has since been modified and used effectively by demographers Clogg, Sullivan and colleagues, to analyze underemployment among different sub-groups in the U.S. labour force (Sullivan, 1978; Clogg, 1979).

Prior to the introduction of the L.U.F., research on underemployment had been criticized for lacking a strong conceptual framework and comprehensive measures (Glyde, 1977). Though not without critics (Tipps and Gordon, 1986), the L.U.F. has come to be seen as the most comprehensive and well developed framework available for the analysis of underemployment. The following discussion of the different L.U.F. categories of underemployment will be useful in clarifying the concept and identifying problems of measurement.

The L.U.F. specifies different forms of marginal employment in relation to full or adequate employment. Adequate employment is defined by default, that is, anything other than the various forms of unemployment and underemployment identified in the classification schema outlined as follows:

SUBUNEMPLOYMENT - includes the so-called 'discouraged workers' who have given up seeking employment because they no longer believe they will be hired. In Canada, there has been considerable argument over whether this category should be included in the official unemployment statistics (Canada, 1984). Subunemployment and unemployment are clearly conditions of non-employment while the other categories represent various states of 'marginal' employment or underemployment (Sullivan, 1978).

LOW HOURS EMPLOYMENT - includes workers in part-time jobs involuntarily (under 30 hours per week in Canada). That is, these workers would prefer to have full-time employment if it were available to them. This condition occurs independent of level of schooling, but it is important to note that an individual's skills may be underutilized no matter how many units of time are worked (Glyde, 1977:248). Thus, an individual may be underemployed in terms of quantity of employment (numbers of hours worked) as well as quality of employment (skill utilization and educational relevance regardless of hours worked).

LOW-INCOME EMPLOYMENT - occurs when workers in full-time jobs receive employment-related incomes (versus incomes form other sources such as welfare) which are insufficient to support themselves or their families. Clogg et al., (1986) define the low-income cut-off point as a figure 1.25 times the poverty threshold specified by the U.S. Social

Security Administration (377). This benchmark may be useful for studying underemployment in total populations; however, a different cut-off might be more effective for examining mismatch (defined below) in a sub-group population such as university graduates.

MISMATCHED UNDEREMPLOYMENT - This category identifies workers who are overeducated for the jobs they currently hold. In other words, these are persons who are inadequately employed because their skills, presumably acquired through formal education, are greater than the skill requirements of their jobs (Clogg, 1979:8). In the original L.U.F. formulation, the mean and standard deviation of completed years of schooling for individuals in each occupational category (from 1970 census data) was calculated. The use of a 1970 baseline was intended to provide an objective way to measure educational upgrading in relation to occupational demand over a long-term period.[3] Individuals more than one standard deviation above this 1970 mean were classified as mismatched.

Unlike the G.E.D. method described below, this measurement technique allows for a wide variation in levels of schooling for each occupational group, and provides a benchmark year (1970) as a relative standard of full employment (Clogg and Shockey, 1984:240). It is very useful for measuring mismatch trends using long-term aggregate data and for comparing rates among different sub-groups of labour force participants.

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[3] The year 1970 was used as a benchmark since this was considered to be a year of "full employment". The problems of defining full employment are discussed in Clogg (1979: 45-56).

However, since this method uses no independent measure of skill, it fails to address the problem of the discrepancy between employer recruitment practices and actual occupational requirements. Thus, an increase in the prevalence of mismatch may reflect growing credentialism in employer hiring standards rather than actual changes in job requirements.

It is also important to note that the L.U.F. does not clearly distinguish voluntary from involuntary underemployment except for the Low-Hours category. This is a conceptual distinction which deserves greater attention in research on underemployment, particularly in relation to the importance of the agency-structure link discussed in Chapter II. As Glyde remarks: "It may be of interest to know why certain individuals choose to work in jobs which do not effectively utilize their skills, but from a public policy point of view it is more important to identify labor market barriers which prevent individuals from doing so" (1977:247).

Finally, the L.U.F. takes an inductive research approach which emphasizes the development of objective socio-economic indicators that are relatively independent of specific economic or social theories of the labour market (Clogg and Shockey, 1984:236). While they generally acknowledge that fundamental issues of social inequality are inherent in the L.U.F. typology, there is little discussion of the relevant theoretical debates discussed in Chapter II. Certainly, the organizational and institutional levels of analysis are missing in their conceptual and operational definitions of mismatch, otherwise they would be more concerned about how formal credentials are used in determining occupational entry.

Nevertheless, the L.U.F. classification system makes an important contribution by identifying the different types of underemployment and devising objective indicators of each type, including education-job mismatch.

The General Educational Development (G.E.D.) Score

This score is one of the worker trait characteristics included in the detailed occupational descriptions in the Canadian Classification and Dictionary of Occupations (C.C.D.O.) and its U.S. counterpart, the Dictionary of Occupational Titles (D.O.T.). Developed by the U.S. Department of Labour in the 1960s, the D.O.T. systematically classifies and describes some 4-5,000 occupations and 30-40,000 jobs in the U.S. economy (Spenner, 1980:241-243). Patterned after the D.O.T., the C.C.D.O. has been used as a tool for job analysis in Canada since the early 1970s.

These dictionaries were compiled by collecting and analyzing comprehensive data on the functional requirements of each occupation. They rate occupations according to the various abilities, traits and characteristics required to achieve average successful job performance (Rumberger, 1981:48). The worker-trait data, as they are called, may be used by employers to assign pay rates and identify training and recruitment standards for different occupations.

The G.E.D. scores, originally devised for use in employment counselling, were developed by trained job analysts. They represent six different levels of reasoning ability, as well as knowledge and skills in mathematics and language usually required to perform various occupational tasks (Appendix 1). The six G.E.D. levels are equated with number of years of schooling, as shown in Figure 2.

Figure 2: General Educational Development Score (G.E.D.) Expressed as Approximate Duration of Formal Schooling

G.E.D. Levels	Approximate Duration of Schooling
6	17 years plus
5	13 to 16 years
4	11 to 12 years
3	9 to 10 years
2	6 to 8 years
1	Less than 6 years

Source: The C.C.C.O. Guide 1988. Ottawa, Employment and Immigration Canada.

The rationale behind the G.E.D. score is that higher levels of general skills and abilities are usually acquired through higher levels of schooling. No distinction is made for differences in the nature of schooling, although another C.C.D.O. score, the Specific Vocational Preparation (S.V.P.) score, equates years of formal schooling, including university and college, to years of vocational preparation provided.[4] For example, a four year university degree is said to be equivalent to two years S.V.P., with the notable exception of a liberal arts degree which is considered to provide virtually no specific job relevant training. Obviously, both the G.E.D. and S.V.P. scores involve questionable assumptions about the relationship between formal schooling and job skill requirements.

Typically G.E.D. scores are used to measure overeducation or underemployment by subtracting a respondent's occupation (the G.E.D. score) from the actual years of schooling completed by each respondent (Rumberger, 1981:58). The use of G.E.D. scores in this way has been criticized for various reasons. First, the scale is limited in range, particularly at the upper end. Only two values (5 and 6) represent post-secondary educational attainment, making it difficult to detect variability in matching schooling with job requirements (Clogg and

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[4] The S.V.P. score measures duration of vocational preparation required for each job.

Shockey, 1984:239). Thus, a G.E.D. score of 5 means the jobs requires anywhere from 1 - 2 years of college or apprenticeship to a four year university degree. In itself, the G.E.D. score does not sufficiently distinguish between different levels of post-secondary education. The fact that the type of education is not scored presents a problem for researchers interested in examining underemployment among certain educational sub-groups.

Secondly, it is difficult to determine the source of skill acquisition. As the C.C.D.O. cautions (Canada, 1971), other aspects of informal education, such as work experience, travel, self study, hobbies and leisure activities, are also responsible for skills development. Hence, there is no one-to-one correspondence between formal education levels and skill level.

Thirdly, the job sampling techniques of the D.O.T. have been criticized for not being representative. Government job analysts tend to evaluate those jobs most convenient to access and do not necessarily keep up-to-date on changing occupational requirements. Furthermore, measurement slippage has occurred as occupational groupings changed between different census years (Spenner, 1980).

Finally, it has been suggested that even trained occupational analysts are subject to biases such as employer practices and occupational prestige. No doubt these factors have an indirect influence on raters. However, both

Rumberger (1981) and Spenner (1980) have examined this problem, concluding that job analysts provide reasonably independent measures of functional rather than desired job requirements.

Despite these weaknesses, Spenner (1980:258; 1988:140) concludes that D.O.T. job characteristic scales, such as the G.E.D. and S.V.P., are fairly valid measures of job requirements particulary in the absence of more direct measures of skill. As he points out, these scales correlate well with indicators of job complexity and autonomy used in job satisfaction and quality of work research. They are also well correlated with measures of occupational prestige (Jones, 1980) and subjective assessment of skill utilization (Myles and Fawcett, 1990).

Furthermore, as Hunter and Manley (1986) demonstrate, G.E.D. and S.V.P. scores are valid measures of the depth and breadth of the skill requirements of a job. While G.E.D. tends to reflect "the extent to which work requires quantitative, and related mental abilities and capacities," S.V.P. indicates "the degree to which an occupation or a job involves the application of knowledge or skills to a wide variety of duties" (Hunter, 1988:756). In fact, Hunter used G.E.D. scores as well as other worker-trait data to identify changing skill levels in occupational requirements at the entry level.

Although the worker-trait data are highly useful in research on changing occupational requirements, particularly in connection with the skilling debate and questions of labour utilization, a more rigorous method of review is needed to ensure these changes are reflected in the G.E.D. and S.V.P.[5] As educational attainment rises, the G.E.D. score range needs to be increased to account for various levels of post-secondary schooling. In addition, greater effort must be made to ensure the G.E.D. and ratings reflect the current knowledge and skills required relative to the knowledge and skills acquired through formal education.

Unfortunately, the Canadian government has not seen fit to continually update these data and, in its current plans to overhaul the occupational classification system, appears to be moving away from a coding system based on objective assessments of job skill requirements.

Subjective Measures

Subjective measures of mismatch rely on individual perceptions of their employment situation relative to their educational attainment. As Harvey explains, underemployment has both a psychological and structural dimension (1974:215). For instance, using objective measures, a person may be adequately matched with the basic requirements of the job, yet subjectively feel their skills and abilities are underutilized. Conversely, someone may be mismatched on the basis of level or type of educational qualifications, yet not view themselves as underemployed, particularly where the organizational environment provides opportunity for greater autonomy and skill utilization. This underscores the necessity to consider individual psychological factors as well as objective structural conditions in assessing underemployment. It also serves as a reminder that there are both private and public consequences of underemployment.

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[5] The last time C.C.D.O. scores were assessed was around 1969-70. Although new occupations are continually added, supplemental information on the range of G.E.D. scores within occupational groups has not been updated.

Typically, a subjective measure of underemployment is obtained by asking individuals about the extent to which their job allows them use their skills and abilities. Harvey (1974) asked Ontario graduates to report how useful their education was for actual job performance to determine if recent graduates found their education less relevant to their first job compared to earlier graduates. In a study of U.S. clerical workers, B. Burris (1983) simply asked respondents if they felt overqualified for their jobs. This was supplemented, however, with indepth qualitative analysis yielding more substantive information on why they felt overqualified for the work they performed.

The most recent study of Ontario graduates used multiple subjective measures to examine the relevance of education and skill utilization on the job, including the relationship of both general and specific skills acquisition to job requirements (Denton et al., 1987). Graduates were also asked about opportunities for use of personal initiative, learning on the job and promotions. These types of questions probe the extent to which organizational structure and task requirements provide opportunity for the skills and abilities of graduates to be utilized.

The validity of subjective measures is sometimes questioned, because variables such as age, experience and gender have been shown to influence individual evaluations of mismatch (Burris, B., 1983:457). Generally these variables are thought to result in inflated estimates of underemployment compared to objective measures (Burris, B., 1983:457; Clogg and Shockey, 1984:240).

Contrary to Clogg and Shockey's claim that there is "no necessary relationship" between subjective reports of mismatch and objective conditions (239), O'Brien argues that individual perceptions of job attributes and skill utilization can be valid indices of the actual job situation. Various studies have demonstrated a high correlation between employee and expert job descriptions. Furthermore, research suggests that changes in objective job conditions such as task significance, skill variety and autonomy produce corresponding changes in job perceptions (O'Brien, 1986:40-45). Overall, there appears to be reasonable evidence that an employee's perception of skill underutilization is a fairly good indication of objective skill deficiencies in the job (45-46). O'Brien (1980; 1983) developed a four-item scale of perceived skill utilization asking respondents to evaluate the extent to which their jobs require them to use their abilities, training and experience and provide opportunity to learn new tasks. These are similar to questions used in the Ontario study of graduates cited above, and can be effective indicators of education-job matching.

Summary

Mismatched underemployment is a difficult concept to define and operationalize largely because there are few valid and reliable measures of skill. Little research has been done on developing task or behaviourally based measures of job skill requirements. Hence, gender and class biases are often inherent in the way the skills of workers and the jobs they perform are assessed and rewarded.

Another reason why the concept of education-job mismatch is difficult to measure is that much of the research lacks the kind of broad theoretical scope necessary to examine both the structural and psychological dimensions of this problem (Harvey, 1974).

For example, the Labor Utilization Framework (L.U.F.) provides a useful conceptual framework for identifying different forms of underemployment. However, the mismatch category, though effective for measuring long-term trends using aggregate level data, accepts employer hiring practices as an indicator of occupational requirements. Since it lacks an objective measure of job skill requirements, neither technical nor employer rationality is questioned. In other words, it is assumed that employers have simply responded to an oversupply of educated workers by hiring university graduates in jobs which do not require this level of educational attainment. The role of employers or professional associations in raising credential requirements to restrict entry (the credentialist thesis) is not accounted for in the L.U.F. measure of mismatch.

The General Educational Development score, on the other hand, does provide a basis for examining the role of credentialism in creating underemployment. It measures individual education-job matching but provides a reasonably independent measure of job skill requirements. More importantly, it equates levels of schooling (skills acquired) with occupational skill requirements.

The G.E.D. score has also proved to be highly correlated with measures of occupational prestige (Jones, 1980) and subjective assessments of overqualification (Myles and Fawcett, 1990). For these reasons, and because this study does not use aggregate population data, the G.E.D. is the most suitable objective method for identifying the educationally underemployed of this study.

Subjective indicators of underemployment were also used in this study adding a psychological perspective to the analysis of mismatch. Are graduates who are technically underemployed any less satisfied with their jobs? How do attitudes and expectations about education and work affect match outcomes for graduates? Subjective evaluations of work, as O'Brien (1986) demonstrates, are often quite accurate when compared with objective assessments of kind and level of work. Furthermore, perceptions about how one's education is used on the job are important regardless of whether general level of schooling and occupational requirements are matched.

Ultimately, the method used depends on what theoretical issues are to be addressed, and whether a macro or micro level of analysis is appropriate. Ideally, both objective and subjective methods should validate one another (Myles and Fawcett, 1990). The following review of the empirical research on underemployment critically examines results achieved using the different measurement techniques discussed in this chapter.

CHAPTER IV. REVIEW OF RELEVANT RESEARCH

Introduction

Major studies of underemployment or overeducation in the U.S. and Canada were conducted during the 1970's and early 1980s. Berg's work, The Great Training Robbery (1970), provided much of the impetus for examining the relationship between educational attainment and occupational structure in the U.S., whereas, in Canada, Harvey (1974) was one of the first to study changing labour market outcomes for university graduates.

The growing concern about education-job mismatch during this period was largely brought on by the burgeoning numbers of young people entering the labour market with college or university degrees at a time of slow economic growth. However, Berg (1970) and Harvey (1974) suggested that the problem of underemployment was not simply a matter of an oversupply of graduates. They pointed to other factors, such as long-term structural changes in the labour market and the growing use of credentials in screening young people for jobs which did not require higher educational qualifications. These authors warned that underemployment among those with higher education indicated significant changes in opportunities for social mobility and status attainment.

This chapter reviews the existing research on underemployment, specifically focusing on education-job mismatch. It begins with a brief overview of research on declining economic and occupational status for university graduates, then summarizes actual rates of mismatch based on both Canadian and U.S. data. Next, it identifies the various structural and individual (human capital) explanations of mismatch examined in the literature on underemployment. The final section of this chapter reviews research on the consequences of mismatch.

Declining Economic and Occupational Status for North American Graduates.

Although the trend was noted earlier (Mills, 1956; Harris, 1949; Eckhaus, 1964), the declining advantages of a college or university degree began to affect Canadian and American graduates more seriously during the late 1960s. Analyzing data for the period 1950 to 1960, Berg had noted an increase in the proportion of higher educated labour force participants in middle rather than upper level jobs, along with a reduction in the numbers of workers with less education in middle level occupations.

By 1975, the declining marketability of college degrees was a hotly debated topic. Using U.S. census data from 1969 to 1975, Freeman (1975) reported a substantial downward trend in absolute earnings as well as the earnings ratio of young male college to high school graduates. While wages for other workers had kept up with the rate of inflation, there was a major downturn in salaries for college-trained graduates. Although he noted a decrease in the growth of job opportunities at the professional and managerial level as a contributory factor (16-18), Freeman attributed this downturn to an oversupply of college graduates as well as a slow-down in economic growth (13)

Freeman's study was criticized for lack of evidence of decline (Witmer, 1980), for methodological flaws (Schwartz and Thornton, 1980), and for the simple fact that earnings ratios and underemployment are different phenomena (Rumberger, 1981; Smith, 1986). Nevertheless, Freeman's data served to rekindle the debate begun by Berg.

Based on aggregate U.S. labour force data similar to that used by Freeman, Smith (1986) observed that the decline in the earnings ratio between college and high school graduates began to reverse after 1975 to the point where college graduates were in a most favourable position by 1983 (95). Yet Smith concluded that the problem of underemployment persisted as fewer occupations requiring a degree were open to the growing numbers of labour market entrants with such qualification. Between 1970 and 1982, for instance, Smith's data showed the proportion of males with four or more years of college in sales and clerical jobs increased from 27 to 59% while proportions for the total employed male labour force changed minimally from 12 to 12.7% (88). Similar employment patterns were found for females with the same level of educational attainment (89).

Canadian evidence also points to a relative decline in both monetary and occupational status for university graduates. Harvey (1974) measured changes in occupational prestige ratings of first full-time jobs obtained by university graduates, and much like Berg, found a shift from the higher- to middle-level prestige range over the period 1960-68 (136). Based on results from Harvey's (1974) study of Ontario graduates from the 1960s, Harvey and Charner (1975) forecast that a declining proportion of graduates would realize higher occupational status or greater social mobility through education.

Similarly, Goyder (1980) noted a downward trend in occupational prestige for university graduates entering the labour market between 1960 and 1972. Mean occupational prestige for first job scores dropped from 65 points to 54.4 points during this period (27), although graduates with bachelor's degrees experienced a smaller decline (32). Overall, the gap between the university and non-university educated had diminished since the early 1960's.

A more recent study reached a similar conclusion. Blakely and Harvey (1988) used the 1973 Canadian Mobility Study data to demonstrate a general downward trend in rates of return to education from 1961-1972. Controlling for time in the labour force, socioeconomic background, gender, and fluctuating labour market conditions, the positive effects of educational attainment on occupational status declined during this period.

From the viewpoint of overall changing wage distributions, Myles et al. (1988) reported a net downward shift from higher to lower wage categories for young labour force participants including postsecondary graduates. In 1981, workers in the 25-34 age group with post-secondary degrees were concentrated in the top three wage categories, while in 1986 a higher proportion of workers with the same characteristics were found in the lower wage ranges (107).

Vaillancourt et al. (1986) reported 'after tax' rates of return on a university education in Canada had declined about 5% between 1971 and 1981. From both an individual and a public investment point of view, these authors support the proposition of a general decline in the monetary benefits of a university degree (454-55).

In both Canada and the U.S., then, there has been a gradual erosion in economic position and occupational status for university graduates. This trend was evident in the late 1960s to early 1970s when the earnings gap between university and high school graduates decreased. While university graduates have maintained their relative economic advantage, more are entering jobs at the middle to lower end of the occupational hierarchy.

When it comes to estimating the extent to which university graduates are actually underemployed or mismatched, results are difficult to compare due to differences in methods of measurement, time-frames and a lack of benchmark data. Nevertheless, the following review of existing estimates from Canadian and U.S. studies will provide some idea of the magnitude of the problem and overall trends in North America.

Estimating Mismatched Underemployment

Although Berg did not calculate actual rates of underemployment in his initial work, a later study using 1971 data found that 51% of all college graduates and 24.8% of the entire U.S. labour force were underemployed (Berg et al., 1978).

Rumberger, like Berg, compared aggregate distributions of educational attainment with aggregate distributions of occupational requirements (measured by GED scores) to obtain estimates of underemployment for various groups of labour force participants. According to his data, 56% of inexperienced workers (those with less than 5 years in the labour market) who had some college education were mismatched underemployed compared to 40% of the total labour force with the same level of educational attainment (Rumberger, 1981:86). Although Rumberger's data imply mismatch may be more of an adjustment problem which decreases with age or experience (an argument to be dealt with later), he also noted that new labour market entrants, particularly college graduates, were in a less favourable situation in 1976 than they were in 1960 (97). Rumberger attributed rising levels of underemployment (overeducation) to a lack of change in the general skill requirements of jobs coupled with rising levels of educational attainment (97).

Using the same method with U.S. census data for 1977-78, V. Burris (1983) found underemployment among those with 16 years of schooling to be approximately 30% compared with a rate of 22% for full-time workers in general (97). Sullivan (1978), measuring mismatch as defined by the Labour Utilization Framework (L.U.F.),[6] had reported that the rate of mismatch in 1970 was much higher among those with 3-4 years of college education (40%) compared to the total working population (10.4%) (Sullivan, 1978:138). However, between 1960-1970, she found there had been little or no change in mismatch for this group, while greater change had occurred among the population as a whole and among those with 1-2 years or more than 4 years of college education.

Clogg and Shockey (1984) also used the L.U.F. definition of mismatch demonstrating a "dramatic and general increase in mismatch prevalence" for all age, gender, race, occupation, cohort and schooling groups over the period 1969 to 1980 (254). Their analysis emphasized the importance of changing demographic profiles in explaining the trend toward mismatch. Their data demonstrate that for those with 16 years of schooling (generally a college degree), mismatch rose from 38.9% in 1970 to 46.8% in 1980 for an absolute increase of 7.9%.

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[6] The Labour Utilization Framework measures mismatched underemployment according to the average level of educational attainment for each major occupational group (see Chapter 2).

Unlike the American research, Canadian studies tend to rely on subjective measures of mismatch, usually asking respondents to report on the educational requirements of their jobs or perceived utilization of education or skills. In his study of Ontario B.A. and B.Sc. graduates, Harvey (1974) found that a 1968 cohort was less inclined to view their education as useful to their jobs compared to those who graduated in 1960 and 1964. Approximately 40% of 1968 male graduates and 35% of female graduates indicated that their education was not useful for current job performance (101).

Subsequent studies of post-secondary graduates in Canada employed many of the same or similar measures as those used by Harvey (1974). In a national survey of 1976 graduates, Statistics Canada explored the question of underemployment for the first time (Clark and Zsigmond, 1981:132). Although "having a job which does not require a degree" was the primary measure, the extent to which graduates wanted a job related to their field of study and their perceptions of education-job relatedness were also important indicators of underemployment. Two years after graduation, only 19% of working graduates with university degrees said their jobs were not related to their studies; yet, 32% of those who worked full-time had jobs for which the employer specified a lower level of education (62).

The 1984 National Survey of Graduates also relied on respondents' perceptions of the match between their educational background and job requirements (Clark et al., 1986). Rates of underemployment were higher for college graduates compared to those with university degrees. In the university group, between 60-70% of graduates in each faculty went into occupations either directly or partially related to their field (65), and 86% of university graduates rated the importance of the match between field of study and job as important (40). Nevertheless, 29% of bachelor degree graduates working full-time reported that a degree was not required for their current job, while 17% said their job was not at all related to their field of study (7). Approximately 10% of these graduates were in clerical jobs, two years after graduation (62).

Finally, a 1986 survey of 1985 Ontario graduates used various subjective measures of the relationship between educational qualifications and job requirements (Denton, et al., 1987). Each measure yielded different rates of underemployment. Thirteen per cent reported general skills acquired through education were 'not related' or 'not very related' to the job, while 24% said the program content of their education was unrelated. Reporting on employer requirements for their current jobs, 55% said a specific degree or diploma was required for their job, 13% said any degree would do, while 26% said no degree was required (191-198).

In summary, the major American studies have taken an economic or demographic approach to analysis using objective indicators such as income (Freeman, 1976), years of schooling and G.E.D. scores (Berg, 1970; Rumberger, 1981), or average levels of educational attainment in major occupational groups (Sullivan, 1978; Clogg, 1979). U.S. research tends to utilize aggregate level data measuring rates of mismatch in different subgroups of the labour force. Estimates of underemployment among college graduates range from 30% to just over 55%.

Estimates of underemployment in Canadian studies are somewhat lower than those described in U.S. ranging from approximately 20 to 30%. However, it is difficult to compare results based on different types of measures across different time periods. Canadian studies focus on graduates and overall labour market outcomes, rather than comparing rates among different population sub-groups. Hence, subjective measures are more commonly used. Only one Canadian study has used both the G.E.D. measure and a subjective indicator of mismatch, but its objective was to compare underemployment across different industrial sectors, not to examine the problem of mismatch among university graduates specifically (Myles and Fawcett, 1990).

Given the above evidence, it is reasonable to assume there has been a significant degree of underemployment among those with a university education entering the North American labour market in the 1970s and the early 1980s. It is also fair to say that the extent to which a university education led to a job requiring this particular level of education declined during the last two decades. Whether this trend has continued to affect graduates entering the labour market since the mid-1980s and on, is an unanswered question.

From previous research, the rate of underemployment among university graduates (or those with at least 16 years of formal education) can be roughly estimated at about 30%. Even an informed estimate, however, is somewhat meaningless in the absence of comparable rates for the overall population as well as longitudinal data on cohorts with different levels of educational attainment. Moreover, statistical data on rates provide little insight into the process of matching education credentials and jobs skill requirements and the changing relationship between formal education systems and the labour market. Hence, the following sections review what the literature has to say about the various factors contributing to underemployment as well as the potential consequences of this problem.

Identifying Causal Variants of Mismatch

Chapter II outlined various theoretical perspectives on the causes of mismatched underemployment. In the research literature explanations of mismatch focus on both structural and individual causes.[7] At the broader level, changing social, political and economic structures, new technology, shifting occupational distributions, and the professionalization of occupations continually influence the supply and demand for labour and the way in which credentials determine access to different jobs. Typically, however, structural explanations emphasize the impact of economic cycles and changing demographic profiles on opportunities for matching, while differences in individual attributes (or human capital) are used to explain why some labour market participants experience underemployment while others do not.

Structural Explanations - The Oversupply Argument

Freeman (1976) is typical of those who view underemployment as a cyclical problem caused by a surplus of college educated workers entering a labour market at a time of high unemployment and low economic growth. In North America, entry of the baby boom generation and the increased participation of women caused unprecedented growth in the size of the labour force between 1960 and 1970. This, combined with increasing levels of educational attainment and two major recessions in 1973-74 and 1981-82, made the situation for new graduates difficult. Canadian youth, in particular, experienced high levels of unemployment.

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[7] Harvey (1974) used the terms structural and psychological to describe these different types of explanations.

The cyclical argument has not endured well as an explanation of underemployment since this problem remains even when unemployment rates are low (Sullivan, 1978:1-12; Clogg, 1979:24; Tipps and Gordon, 1985:47). For example, Harvey and Kalwa (1983), using data on five cohorts of Canadian graduates between 1960 and 1976, initially concluded that labour market conditions had a greater effect on occupational status attainment than an individual's type or level of degree, academic performance or socio-economic background. In 1988, however, Blakely and Harvey reported fluctuations in returns to higher education were independent of high or low demand for labour. They suggested rates of mismatch may be increasing despite higher economic activity and demand for new employees.

Demand for post-secondary education has also been immune to what Freeman refers to as "response supply behaviour" (1976:52-3). According to human capital theory, college or university enrolments should have decreased as a result of high levels of unemployment or underemployment among graduates. On the contrary, the supply of graduates has continue to grow well into the 1980s, as other researchers had predicted (Zsigmond et al., 1977; Smith, 1986).

In Canada, university enrolments have continued to rise throughout the 1980s (see Figure 3). Although the rate of increase for enrolment in university undergraduate programs began to slow down somewhat after 1984-85, it is still growing at a rate of 2-3% per year (Statistics Canada, 1990:43).

Figure 3: Full-time University Enrolments During the 1980s

1978-79	368,000
1981-82	382,600
1984-85	461,000
1988-89	499,400

Source: Statistics Canada, Education in Canada. A Statistical Review for 1988-89 (August, 1990, #81-229, Table 4, p. 57).

Furthermore, as the level of educational attainment in the general population has risen, the proportion of post-secondary graduates in almost all occupations has increased (Picot et al., 1984). Similar trends have been reported in the United States. Long-term historical data indicate that most of the increase in educational attainment in the labour force has been due to gradual upgrading within occupations, rather than changing occupational requirements (Folger and Nam, 1964; Rodriguez, 1978). The structure of labour market opportunity, then, must be considered along with the increasing proportion of graduates entering the labour market.

Will enrolments ease off with a declining youth population? As demographers argue, high rates of unemployment and perhaps underemployment experienced by young labour market entrants during the past two or three decades are to a large extent due to generational crowding (Denton, et al., 1980; Foot and Li, 1986). No doubt, the baby boom bulge will continue to affect opportunities for future promotion and career mobility (Foot and Venne, 1990). However, the demographic argument implies that subsequent birth cohorts, being much smaller in size, will have an easier time finding adequate employment. Clogg and Shockey (1984), for instance, present evidence that much of the difference in mismatch between various groups in the U.S. labour force can be accounted for by relative cohort size (254).

Yet Myles, Picot and Wannell's (1988) analysis of changing wage distributions in Canada reports that a shrinking supply of young workers has not offset "a remarkable downward shift in the relative wages of young workers between 1981-86" (101). This lends support to Rumberger (1981) and Smith's (1986) argument that demographic factors, alone, cannot account for changing labour market outcomes for graduates. Myles et al.'s (1988) findings suggest smaller youth cohorts may fare no better than the larger cohorts who preceded them. They say this is due not only to industrial and occupational restructuring, but also to a relative decline in wage rates for jobs held by younger people including university graduates.

Moreover, declining birth rates and diminished returns for those with higher education, have not suppressed demand for post-secondary education. Labour market conditions and demographic trends are an important part of the picture, but these alone do not suffice to explain the persistence of underemployment. Hence, the traditional sociological questions of who gets the best jobs, and why, continue to be of utmost importance, even for those with higher education.

Individual Explanations - The Human Capital Argument

Years of Schooling and Field of Study

By definition alone, mismatch is usually associated with higher levels of educational attainment. Sullivan (1978) observed that labour utilization "seems to improve until 12 years of school are completed, when mismatch rises and utilization deteriorates" (137). However the relationship is not strictly a positive linear one since several studies report graduates with 13-15 years of post-secondary education are less likely to be underemployed than comparable cohorts with 16 years of schooling.

For instance, the 1978 National Graduates' Survey (Clark and Zsigmond, 1981:62,132) reported underemployment was highest among Canadian graduates with bachelor's degrees (38%) compared to those with post-graduate degrees (11%) or community college degrees (25%). Although 81% of graduates said getting a job related to their field of study was important, only 42% of these graduates were able to make the match.

However, the 1984 National Graduates Survey reported a lower rate of underemployment among university Bachelor degree holders (29%) as opposed to college graduates (35%) and generally concluded those with higher education credentials fared better in the labour market (Clark et al., 1986:6-7).

Rumberger (1981) linked overeducation with higher levels of educational attainment, but found that from 1970-76 the largest increase in underemployment in the U.S. occurred among those with 16 years of schooling (1979:109). For the period 1970-80, Clogg and Shockey (1984) calculated rates of mismatch that were much smaller for those with 13-15 years of schooling compared to those with 16 years and over (246).

Contrary to these data, V. Burris (1983) noted overeducation was greatest for workers with middle-levels of educational attainment. Graduates with 16 years of schooling, surveyed during 1977-78, had a lower rate of overeducation (30.7%) than those with either 13-15 years or higher levels of educational attainment (458). Furthermore, there was less of a discrepancy between younger and older workers among those with 4 years of post-secondary education. This prompted Burris to speculate that community college graduates and graduate degree holders were primarily responsible for the trend toward overeducation (459).

Along with years of schooling, field of study is also a factor in determining which graduates have a higher probability of finding suitable employment. Harvey's (1974) group of 1968 Canadian graduates in humanities, social science, and natural science were less likely to define their education as useful compared to those specializing in other fields of study (102). Using the same data, Harvey and Charner (1975) concluded higher occupational attainment was evident for those with graduate degrees, bachelor level degrees in science rather than humanities, and those with higher marks (143), while Harvey and Kalwa's data (1983) showed males with graduate degrees and females in science did better than their counterparts with other types of degrees (446-447).

Both National Surveys of Graduates demonstrated that higher rates of underemployment were experienced by those with degrees in social sciences, humanities, fine and applied arts, and natural science, compared to those with degrees from other faculties. Fine and applied arts, humanities and social sciences graduates did not fare well according to the Ontario Graduates Survey, while those in the health professions and occupations had the best match between education and job (Denton et al., 1987:204).

In general, graduates from programs with less of an occupational or professional orientation are most likely to experience underemployment. Following one of the basic tenets of human capital theory, this type of explanation puts the blame for mismatch on individual choices about what kind of degree or field of study to pursue.

Others would argue that traditional sources of inequality such as gender, race and socio-economic background continue to explain who rises to the top of the occupational hierarchy.

Socio-economic Status, Gender, Race and Age

Given that minority groups are often disadvantaged as far as labour market outcomes are concerned, one might expect rates of underemployment to be higher among women, certain ethnic groups and people of lower socio-economic status despite individual levels of educational attainment. V. Burris (1983), for example, found U.S. workers from middle class backgrounds at all levels of educational attainment, were generally less likely to be underemployed (458). Generally, however, studies of underemployment suggest workers of minority status are not necessarily more likely to experience education-job mismatch. As status attainment research indicates, these variables come into play early on in the educational selection process.

Recent Canadian evidence suggests socio-economic status has little effect on level or field of study once students enter university (Guppy et al., 1988). However, opportunities for equal access to a university education may be on the decline as post-secondary institutions are faced with fiscal restraint and rising tuition fees. During the 1970s Harvey and Charner (1975) observed that education credentials had become less effective in insuring higher status occupations for young people from the middle class and increasingly more important for those from lower class backgrounds (148). Between 1970-80, however, a declining proportion of Canadian youths from lower class backgrounds entered the university stream indicating that opportunities for mobility through higher education have probably diminished (Guppy et al., 1988).

The question of racial discrimination is more prominent in the U.S. research on underemployment. For instance, Rumberger (1981) concluded blacks were more overeducated for their jobs than whites, although not at higher education levels (80). V. Burris (1983) concurred that blacks with a college degree were less likely to be underemployed than whites with the same credentials (458), but found workers from ethnic minorities were, on the whole, somewhat more likely to be overeducated for their jobs.

Curiously women, in general, do not seem to be adversely affected by mismatched underemployment. Rumberger (1981:80-81) reported women at all levels of schooling experienced approximately the same levels of overeducation as men while overall, V. Burris (1983) found males were slightly more overeducated for their jobs than females.[8] Comparing college graduates to those with a high school diploma, Rumberger observed that the relative position of males had deteriorated while there had been no such decline for females (1981:90). His data showed a slight tendency toward higher rates of overeducation among males with a B.A. level of education.

Clogg and Shockey examined the effects of both sex and race on mismatch finding that while rates of increase for women and blacks with 16 years of schooling were large compared to non-black males, the proportion of mismatched non-black females with this level of education was lower than any other group (244).

As for Canadian graduates, Harvey and Kalwa (1983) studied the effect of academic average on occupational status concluding there were no differences between males and females. On average, males achieved higher occupational status than females but the substantive difference was not large (444).

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[8] This difference was almost entirely due to greater overeducation among males with 12 years of schooling.

V. Burris (1983) offers a plausible explanation for insignificant gender differences in mismatch. Male graduates, he speculates, are more likely to be hired for higher status managerial jobs where they might be technically mismatched. Female graduates, on the other hand, tend to enter occupations in teaching health and welfare where certification standards call for degrees. Thus, a larger proportion of females would be matched (458). Myles and Fawcett (1990) lend credibility to this explanation by demonstrating that women are generally excluded from jobs where the emphasis is placed on employer sponsored job training, thus they are more likely to be in jobs where formal credentials regulate entry (29).

While the studies reviewed suggest there may be no significant differences between male and female graduates as far as underemployment is concerned, there is still a pronounced income gap. For example, Leiper and Hunter (1990) confirm that Canadian males with post-secondary education degrees reap higher earnings returns than females with the same level of investment in education (13-14). Furthermore, women graduates may be more severely underemployed compared to their male peers, since they tend to be overrepresented in involuntary part-time jobs and lower level clerical positions (Clark et al., 1986:62; Tipps and Gordon, 1985:44).

Age, along with cohort size, also accounts for underemployment among those with higher education. While both younger and older workers are more susceptible to underemployment, mismatch is often assumed to be a temporary, inevitable phase of labour market entry, even for those with higher education. As Clogg explains:

> "A certain length of tenure in a low-skill status might be necessary for acquired skills to be proven and for on-the-job skills to develop which in turn, might subsequently open up the proper channels through which a worker's skills can be fully utilized" (Clogg, 1979: 47).

Nevertheless, Clogg's data show the rate of mismatch for the 20-34 age group rose steadily by about 1% per year between 1969 and 1973, "despite countervailing tendencies in other forms of underemployment" (1979:202). Rumberger (1981) had also observed an increased incidence of overeducation among young inexperienced workers during a similar time frame, while Myles and Fawcett's (1990) data from a 1973 survey revealed higher rates of mismatch among workers aged 18-29 versus those 30 and over.

Thus, as graduates gain more labour market experience, underemployment might be expected to decline. The age and experience factor, however, may not work to the advantage of those whose initial post-graduate labour market experience entails marginal employment. Boyd et al., (1985), for instance, found previous occupation overrides the importance of educational attainment in later career stages (522-23). Furthermore, frictional age effects (e.g., the presumed tendency for youth to change jobs frequently) must be isolated from cyclical age effects due to changing cohort size.[9]

Rumberger (1980) and Smith (1986) offer another explanation of the relationship between age and underemployment. They both argue that Thurow's job competition theory explains why incomes of college graduates remain relatively high despite decreased opportunities to enter higher level occupations. Older workers, they suggest, typically do not compete for entry level jobs graduates for which apply. Thus, an oversupply of graduates leads to deflation of wages. High school graduates, on the other hand, tend to enter jobs where wages are not usually based on age or experience. Hence, an abundance of such labour force entrants is not as likely to bring about a decline in wages. Nevertheless, both Smith and Rumberger predicted high school graduates would continue to be relatively disadvantaged, as those with higher education credentials are hired into middle level jobs where degrees have not been required.

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[9] Recall that Clogg and Shockey (1984) later linked increased prevalence of mismatch to the relative size of an age cohort and its level of educational attainment (252).

Attitudes Toward Work and Expectations of Matching

Finally, individual attitudes and expectations have been examined as a cause of underemployment, though more often in speculative rather than empirical terms. V. Burris (1983) concludes that individual perceptions of overeducation depend on the type of school attended, the fit between course of study and present job, length of time since leaving school and the educational distribution of the immediate work group. In his view, the problem stems from unfulfilled aspirations for income and status based on prevailing social norms about the 'appropriate' level of education for each occupation, rather than changing technical skill requirements and underutilization of skills and abilities (464-465).

In a qualitative study of clerical workers, B. Burris (1983) discovered that workers from all educational backgrounds felt overqualified for their jobs. She proposed that the 'new working class' theory provides the best explanation of underemployment since it emphasizes the conflict between hierarchial control in the workplace and norms of autonomy, freedom and creativity spawned in younger generations of workers (107-108). Changing attitudes toward work and work organizations may certainly affect the way young people evaluate their jobs. In view of growing evidence about the changing nature of work and restructuring of youth labour markets, however (Ashton et al., 1990), new working class theory is not likely to emerge as a prominent explanation of underemployment.

Nevertheless, the role of attitudes in explaining higher rates of mismatch among youth deserves further attention, particularly since young people are often assumed to have higher expectations and less of a commitment to the workforce (Osterman, 1980, Furnham, 1984a; Church and Ainley, 1987:73).

Summary of Causal Variants

Many of the traditional variables used to explain differences in labour market outcomes offer only partial insight when it comes to explaining mismatched underemployment among university graduates. Structural arguments about economic or demographic cycles are compelling, yet the problem persists in the face of declining unemployment, rising post-secondary enrolments, and smaller youth cohorts.

Individual explanations have received greater emphasis in the empirical literature, but the evidence is somewhat inconsistent and contradictory. Generally, level of educational attainment has a positive effect on matching. However, some researchers have found those with bachelor level degrees have higher rates of underemployment compared to those with college or graduate degrees (Rumberger, 1981:109; Clogg and Shockey, 1984:246). Ethnicity and gender also interact with level of educational attainment to produce variances in rates of mismatch among different population sub-groups (Rumberger, 1981; Burris, 1983; Clogg and Shockey, 1984). In other words, an incremental increase in level of educational attainment does not necessarily lead to less risk of underemployment.

Choice of faculty or field of study is crucial to education-job matching, but only within the context of labour market demand for specific occupations linked to specialized degree programs. Gender and socio-economic status account for little variance in mismatch among university graduates, yet these factors obviously influence educational and occupational choice. Younger workers are definitely more prone to mismatch but there is scant evidence to confirm whether this is due to attitude, immaturity, inexperience, or changing demographic profiles.

Clearly, there is a need for ongoing research to substantiate existing explanations of mismatched underemployment and to gain greater insight into the nature and extent of this problem.

The Consequences of Mismatch

The literature is full of speculation about the consequences of underemployment but few researchers have examined this question empirically. Two areas where mismatch might be expected to have a measurable effect are individual incomes and job satisfaction.

Job Dissatisfaction and General Discontent

Mills (1956) had predicted growing underemployment among those with higher education would lead to increased boredom with work and general disillusionment. Others such as Gorz (1967), Blumberg and Murtha (1977), and Bowles and Gintes (1976) thought that underemployment and job entitlement beliefs (Derber, 1978) were stirring up social discontent and radicalism among youth.

V. Burris (1983) found no evidence of increased radicalism among underemployed youth. They were more dissatisfied with their jobs, were slightly more liberal in their political leanings, and somewhat less supportive of the achievement ideology (belief in getting ahead by hard work) than those who were adequately employed. However, they were no more alienated politically and tended to be somewhat less supportive of organized labour (463-4). Furthermore, only those who were highly overqualified for their jobs were negatively affected in terms of job satisfaction and belief in achievement ideology (460, 463).

V. Burris' (1983) study is the most comprehensive examination of the effects of underemployment on workers' attitudes. Berg (1970) and others suggested that overeducation was one of the most consistent causes of job dissatisfaction among U.S. workers, while Kalleberg and Sorensen (1973) found workers who were overtrained (overeducated) had lower job satisfaction and job involvement scores than those who were not.

However, V. Burris (1983) concluded the effects of overeducation on workers' attitudes is "neither as strong nor as widespread as many have claimed" (454). Citing an earlier study by Kornhauser (1965), he proposed that overeducation is more likely to impact individuals on a psychological level leading to self-blame, low self-esteem, or general dissatisfaction with life (465). Those affected, he suggests, probably tend to seek gratification through non-work activities such as family and leisure rather than turn against the system.

B. Burris (1983) generally agrees with this proposition. Her study revealed that overqualification leads to increased job dissatisfaction, higher turnover and reduced job involvement (96). Clerical workers with 2 years of college education or more tended to project their dissatisfaction externally, either pursuing additional educational qualifications or participating in intellectual or cultural activities outside of work (103).

Underemployed college graduates in this study tended to feel superior to their co-workers or to criticize the organization; whereas, workers with less education blamed themselves for their work situation (102-107). Hence, psychological and social responses to overeducation may depend on the degree to which one is overqualified for the job as well as on perceptions and expectations of status attainment.

In the 1984 National Survey of Canadian graduates (Clark et al., 1986) 27% said they would select a different educational program if they had to choose again (94). Those in jobs where the match between education and employment was low were the least satisfied with their education (91). After two years in the labour market, more than 40% of graduates with bachelor's degrees felt they should return to post-secondary institutions for career oriented training (52).

This study found that the match between job and education level was more important than income in determining job satisfaction among graduates (71). Nevertheless, few respondents reported dissatisfaction with their jobs despite the fact many were underemployed (60).

In general, these studies conclude that mismatched underemployment has a negative impact on job satisfaction. However, this effect does not appear to be as severe in magnitude as some had predicted.

Mismatch Effects on Income

Recently the underemployment issue has been revived in studies examining the effects of education-job mismatch on earnings. Rumberger (1987), using both subjective and objective measures of mismatch, determined that for males and females educational attainment that exceeds job requirements is rewarded at a lower rate than schooling which does not exceed job requirements. This pattern was consistent for survey data from 1969, 1973 and 1977.

Rumberger used a standard earnings regression model including various levels of surplus schooling, work experience, gender, and race applied to data from the Quality of Working Life Surveys (Quinn and Staines, 1979). Estimates for 5 different occupational categories were derived separately (30-37). Each additional year of schooling raised annual earnings by 5% for males and 10% for females; yet, those whose education did not exceed job requirements received an economic return on schooling twice as large as those who were overeducated for their jobs (35).

In professional and managerial occupations, however, rates of return to surplus schooling were the same as returns to required schooling for males. But women professionals and managers were rewarded at a lower rate than those whose qualifications did not exceed job requirements (38).

It is evident, from Rumberger's (1987) analysis, that the effects of overeducation on income vary by gender and across different occupational groups. One cannot assume overeducated workers earn less money because they are less productive, he argues, since certain jobs provide an opportunity to utilize excess schooling while others do not (46). Thus, he concludes the relationship between education and earnings is much more complex than human capital theory suggests.

Shockey (1989), using the L.U.F. method, found that while there were significant declines on returns to schooling between 1972-82, mismatched workers actually earned more money and realized higher returns for each year of schooling than those who were properly matched (858-859). There is less of a labour market advantage for matched workers, he argues, as each additional year of education results in smaller returns for post-secondary graduates. Overeducated workers gain access to better jobs with high productive or earnings potential even though technically, these jobs could be performed by people with lower levels of educational attainment (861-62). Shockey does not describe what types of jobs these might be or offer an explanation of why credentials are so highly valued by employers. However, this research definitely contradicts Rumberger's findings that mismatched underemployment has a negative impact on earnings.

Conclusion

This chapter reviewed the research on underemployment examining various estimates of the rate of mismatch as well as the causes and consequences of mismatch among college or university graduates in North America. Much of this research has been devoted to finding ways of measuring underemployment as researchers struggle with the psychological and structural dimensions of the concept.

Estimates of underemployment vary considerably depending on the method of measurement used, the population sampled, and the time frame examined. The approximate level of mismatched underemployment among university graduates may be about 30%.

Due to inconsistencies in methods of measurement, long-term trends are difficult to verify but generally, these studies indicate an increase in mismatched underemployment over the past two decades. Further comparative and longitudinal data are needed to assess if and to what extent this problem continues to affect Canadian university graduates.

Research on the causes and consequences of mismatched underemployment leaves much room for ongoing qualitative and quantitative research. Certain patterns of evidence have begun to emerge. For instance, socio-economic status, gender and race have little direct effect on matching; whereas, age, relative size of birth cohort, and choice of faculty or field of study clearly influence the probability of match. Overall, underemployed graduates earn less money and are less satisfied with their jobs but show no signs of outright social or political unrest as had been predicted. This is probably largely due to the fact that university graduates are still better off than those with a high school education.

Though mismatched underemployment has a negative effect on job satisfaction and earnings, these effects are not as great as might be anticipated given the expectations of many young graduates. Furthermore, mismatched graduates may be rewarded for their credentials regardless of mismatch. They also have other options open to them (e.g., entry into graduate programs or greater promotional opportunities) due to their level of educational attainment. In sum, more needs to be known about how and why underemployment affects those who have invested so much in education as a means of improving their labour market position.

In addition to more effective measures of education-job mismatch and long-term data on changing rates of underemployment in different cohorts, we need more detailed comparative analysis on what happens to graduates as they enter the labour market. We still know little about causal and consequent factors from both a structural (e.g., how does the structure of the labour market affects educational and occupational aspirations and opportunities for matching?) and an individual point of view (e.g., how do individual attributes and attitudes toward work and school affect match outcomes?).

This study makes a contribution to underemployment research by using both objective and subjective indicators to measure education-job mismatch among a group of university graduates who entered the labour market in 1985. More importantly, it examines how well the various explanations about the causes and consequences of mismatch, discussed in the literature review above, apply to this particular group of graduates. Three major research questions are addressed: 1) How many of these graduates were underemployed (mismatched)? 2) Which graduates were more likely to be mismatched and why? 3) What were the consequences of being mismatched compared to graduates who were matched? Details on research methodology and data are outlined in Chapter V.

CHAPTER V. RESEARCH QUESTIONS AND METHODOLOGY

Introduction

This chapter describes the data and methodology used in this study, outlining numerous questions and hypothesis about education-job mismatch. As emphasized in the previous chapters, explanations of mismatched underemployment and its consequences are drawn from several different theoretical orientations. Hence, the approach of this study, though deductive, will not be one of testing a general theory about underemployment (Glaser and Strauss, 1967). Having said this, it is important to recognize that human capital theory provides many of the testable hypotheses for this study. In analyzing and interpreting the data, however, some of the larger theoretical questions discussed in Chapter II are also addressed.

Data and Methods

The decision to use original data from the Study of Transitions from School to Work (Krahn and Lowe, 1990a and b; Krahn, 1988) was based on the need to access longitudinal panel data on graduates entering the labour market during the mid- to late 1980s. Though the initial impetus for the study was the high youth unemployment rate during the early part of the decade, the subsequent questionnaires were designed to obtain data pertinent to many other aspects of the school-to-work transition. Both high school and university graduates from Edmonton, Toronto, and Sudbury were surveyed in May 1985, May 1986 and again in May 1987.

Funding for data collection in the first year was obtained from a wide range of sources including Alberta Manpower, the province of Ontario, the cities of Toronto and Edmonton, The Royal Bank, the University of Alberta, Laurentian University, and the federal Solicitor General's department. Years two and three were supported by a Social Sciences and Humanities Research Council grant. Subsequently, funding for a follow-up survey in 1989 was obtained; however, the data were not available for analysis in time for this study (Krahn, 1988:3).

The 1985-87 data have yielded interesting findings (Krahn, 1988; Lowe, Krahn and Tanner, 1988; Krahn and Lowe, 1990a and b; Krahn and Lowe, 1991; Lowe and Krahn, forthcoming). First of all, many students are staying in school even after completing a university degree, primarily for job related reasons. Though far more likely to obtain a managerial or professional job than their high school cohorts, a university degree does not necessarily guarantee access into these higher status jobs. A considerable proportion of graduates are working in clerical and sales jobs two years after leaving university. Many of these jobs are in consumer services or other service sectors where the quality of employment is rated relatively poor compared to other industrial sectors (Krahn and Lowe, 1990a).

Secondly, the Study of Transitions from School to Work data identified a clear pattern of gender segregation in the types of jobs entered by university graduates (Hughes, 1988; Krahn and Lowe, 1990a and b, Krahn and Lowe, 1991) as well as minor differences in labour market outcomes (Hughes, 1988). Women continue to be underrepresented in occupations related to science, engineering and math, and are still less likely than their male peers to occupy managerial or administrative positions. Meanwhile, the faculties of Education and Arts continue to attract a high proportion of female undergraduates.

Sampling and Attrition

The university sample in this study consists of graduates with 4-year bachelor's degrees from the universities of Alberta and Toronto and Laurentian University in Sudbury. Questionnaires were distributed by mail to a systematically selected sample (every third name on the list of graduands) of Education, Engineering, Science, Arts and Business. Post-graduate faculties such as Law, Medicine and Dentistry were eliminated since they normally require a degree prior to entry and move into highly regulated labour markets. Other faculties such as Nursing or Recreation Administration were omitted because of small enrolments. Since the primary purpose of the sample was to examine youth labour market transitions, mature students (those over the age of 30 at the time of graduation) were also excluded from the sample.

Just over 1,300 graduates completed the first questionnaire and about 90% provided contact information for follow-up purposes (Krahn and Lowe, 1990b:9). By May 1987, the university sample consisted of 875 respondents including 505 females and 370 males. There were 421 graduates from the University of Alberta, 326 from the University of Toronto, and 128 from Laurentian University in Sudbury (Krahn, 1988).

Table 1 indicates sample size, attrition and response rates for the university sample. Attrition biases include lower response rates in general for University of Toronto graduates, likely due to greater data collection resources at the University of Alberta. There was also a tendency for more females to respond (69.1% compared to 61.4% of the males) while age and marital status had no significant effect on attrition. Non-Canadian respondents were less likely to remain in the study, and one of the socio-economic status indicators was related to attrition among Toronto university participants (15).

No significant variation was observed across the five faculties for the sample as a whole, although a higher drop-out rate for Science graduates was evident in the Alberta sub-sample. Only 58.9% of those graduating from Science continued to participate compared to 74.4% in Arts, 70.5% in Business, 78.3% Education and 79.2% in Engineering. Alberta graduates who worked during their last term in school also had a significantly higher survival rate (75.2%) compared to those who did not work (67.5%), as did those reporting higher grades (79.5%) versus graduates with the lowest grades (64.6%) (Krahn, 1988:14-15).

In sum, differences in university of graduation, gender, ethnicity, socio-economic status, grades, and working while in school are potential sources of bias in the Study of Transitions from School to Work data. Since these differences are also germane to the study of underemployment, they are not overlooked in subsequent data analysis.

For the purposes of this study, graduates from Laurentian University in Sudbury were not included since their numbers were too small to make city to city comparisons. Further sample selection was necessary to eliminate graduates who went on to obtain additional education credentials. Thus, only those who did not continue their education for more than two months full-time or part-time between 1985 and 1987 remained part of the sample, leaving a total of 487 subjects. The cut-off for continuing education was set at two months since some graduates might

Table 1: Canadian Youth Employment Study: Sample Sizes and Response Rates, University Respondents, Edmonton and Toronto.

	May, 1985 TIME 1	May, 1986 TIME 2	May, 1987 TIME 3
Edmonton	589	458 (78%)	421 (71%)
Toronto	519	358 (69%)	326 (63%)
TOTAL	1108	816 (74%)	747 (67%)

SOURCE: Krahn, H. 1988. A Study of the Transition from School to Work in Three Canadian Cities: Research Design, Response Rates and Descriptive Results. Edmonton:Population Research Laboratory, Department of Sociology, University of Alberta.

possibly obtain enough credits in one post-graduate term to obtain another degree.

Advantages and Disadvantages of the Data

Many previous studies of education-job mismatch have been cross-sectional, yet longitudinal data are critical to understanding how and why graduates become underemployed, both from a structural and psychological perspective. These data provide an opportunity to follow the process of matching for graduates entering two distinctly different urban labour markets in the mid to late 1980s. Since most of the respondents from the Universities of Toronto and Alberta found jobs in the local area, regional variations in local labour market conditions can be examined. This is something which studies using aggregate level data often fail to do.

Furthermore, these data contain detailed employment histories along with changes in employment status so that labour market progression can be traced. Many studies rely on cross-sectional data or aggregate level data providing little insight into the process of becoming underemployed, or qualitative differences in the kinds of jobs obtained by matched or mismatched graduates (Burris, V.; Rumberger, 1981; Clogg and Shockey; 1984). Frequently, two-digit occupational codes are used making it difficult to identify and compare different types of jobs and their educational requirements. The eight-digit codes used in the C.C.D.O. would be preferable because they include all the worker trait data ratings. Fortunately, G.E.D. scores could be assigned to the four-digit occupational codes used in this study.

A key advantage of the data from this study is the ability to construct and compare subjective and objective measures of mismatch. An objective measure can be devised by re-coding the four-digit occupational groups according to their G.E.D. scores. Key subjective measures are included, although they are not as specific as the question used in the 1984 National Graduates Study (Clark et al., 1986). For example, "My job lets me use my skills and abilities" does not relate skill utilization to educational program, although for graduates with little job experience, this is not so problematic. Similarly, responses to "My job lets me use my education and training" does not isolate educational acquisition from on-the-job training. In fact, questions about on-the-job training are not included in the employment histories. Regrettably, some of the more interesting questions about the use of credentials in employer hiring practices will not be answered by these data, although some insights will be gained from the graduates' perceptions of the education job-matching process.

The psychological aspects of underemployment require further research. According to a survey conducted by the American Council on Education and by the Higher Education Research Institute at the University of California at Los Angeles, university graduates in the mid-1980s tend to hold more conservative beliefs than graduates of the 60s and 70s (Globe and Mail, January 16, 1988). Thus, they may have greater expectations of finding a job related to their degree. On the other hand, these graduates may have lowered expectations in response to labour market signals that their degrees may no longer be as marketable as they once were.

Are there differences in attitudes and expectations about education-job matching among this group of graduates? How do these factors relate to underemployment? Few studies have pursued these questions and where they have been considered, measures of attitudes and career expectations are retrospective (Denton et al.,1986).

The Study of Transitions from School to Work questionnaire includes measures of self-esteem, political preferences, and other variables relating to the psychological consequences of underemployment discussed in the literature. However, these variables will not be pursued in this study because they merit a separate analysis with a different theoretical emphasis.

The most obvious methodological problem in this study is that the sample of graduates, though randomly selected, was drawn from only two universities and five major non-professional faculties. Thus, results cannot be generalized to the population of graduates as a whole. These graduates nevertheless represent two of the largest universities in Canada as well as two different geographic and economic regions of the country. The collection of detailed longitudinal panel data on labour market experiences, necessary for an in-depth look at the causes and consequences of underemployment, is logistically and financially prohibitive with a large nationally representative sample. The National Graduates Study would also have provided a suitable data base for examining underemployment. However, results from the most recent survey were unavailable for this study.

On balance, this research emphasizes transitional processes as well as the structural and psychological variants of underemployment offering several significant advantages that are not provided by other data sets.

Research Questions, Hypotheses and Methods

The following section discusses the major research questions to be addressed in this study. Each of these questions leads to specific hypothesis about the extent, causes and effects of mismatch among this particular group of university graduates.

HOW MANY OF THESE GRADUATES WERE MISMATCHED?

To obtain an objective measure of mismatch, G.E.D. scores were assigned to each respondent's four digit occupation code. Additional information on job entry requirements was provided in Volume 2 of the C.C.D.O. (Canada, 1971). Along with the researcher's knowledge and experience in job analysis, this information was used to determine if a university degree is normally required for a particular occupation.[10] Respondents were then categorized as matched to the job or mismatched according to reasonably objective criteria, something which other Canadian studies have not done.

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[10] Job description data on the original questionnaires helped to clarify uncertainties about which occupation or G.E.D. code would be most accurate.

Some judgement was required in assigning appropriate G.E.D. scores. For example, the occupation of accountant (C.C.D.O. code 1171) includes jobs such as branch accountants in banks, credit officers, and investments analysts (rated as G.E.D. 4) and accountants and auditors (rated as G.E.D. 5). The managerial and administrative group of occupations also varies in G.E.D. scores. The category of other managers (C.C.D.O. code 1149), for instance, includes jobs such as manager of vehicles and equipment, restaurant managers, and administrative jobs which clearly do not require a university education.

Detailed job self-reports in the questionnaires were checked when there was some doubt about the initial coding of the occupation, or the appropriate level of G.E.D. score to assign. Ultimately, a new dichotomous variable was created with values of 0=mismatched (job G.E.D. score was lower than 5) and 1=matched (job G.E.D. score was 5 or 6). Thus, each case was coded as a 1 or 0 for occupations reported in May 1986 and again in May 1987.

Mismatched graduates are those who occupy jobs not requiring the level of education they have acquired through formal schooling (i.e., they are in jobs which could be performed by those without a university education). Matched graduates occupy jobs which require a level of educational development usually acquired through 16 or more years of education (the equivalent of a bachelor's degree or higher).[11] The measure of match status, then, does not reflect the extent to which graduates are overqualified or underemployed, but only whether they are in one or the other category.

As discussed in Chapters III and IV, different measures of mismatch can lead to wide discrepancies in estimates of this type of underemployment. Both subjective and objective measures can be effective, particularly if they are used to validate one another. In this study, both types of measures are used to assess the hypothesis that **subjective measures produce significantly higher estimates of mismatch than objective indicators** (Clogg and Shockey, 1984:240; Burris, V. 1983:457).

The subjective indicator commonly used in studies of underemployment asks respondents if they are overqualified for their jobs given their experience, education and training. Although this question might be expected to prompt more graduates to say they were underemployed, other research demonstrates responses to this measure are highly correlated with G.E.D. measures of mismatch (Myles and

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[11] There were only a handful of graduates in jobs with G.E.D. score of 6, who might be labelled 'overqualified' for their jobs.

Fawcett, 1990).[12] Unfortunately, such a measure was not available for this study.

The two subjective measures used in this study are: 1) job related to education and training (strongly agree = 5, strongly disagree = 1); and 2) job allows use of skills and abilities (strongly agree=5, strongly disagree=1). These questions are often used to distinguish between perceptions of general skills and specific skills utilization (Denton et al., 1987). By using and comparing results on both objective and subjective measures, including indicators of skill utilization, this research tests not only the validity of these different measures but also reveals more about how and why graduates perceive themselves as underemployed.

For instance, some of those who are objectively mismatched may find their skills and abilities are fully utilized on the job; whereas, some of the matched may report low skill utilization even if their jobs are more directly related to their degree. Opportunities for skill utilization may vary according to different organizational structures, management styles, or in the case of Education or Engineering graduates, by requirements for two years on-the-job training, prior to full professional designation.

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[12] This question, along with other measures of underemployment, was used in the 1989 follow-up survey, based on the recommendations arising from this research.

The Labour Utilization Framework (described in Chapter III) suggests various forms of underemployment are not necessarily mutually exclusive of one another. Hence, it is necessary to determine the extent to which mismatch is related to other forms of underemployment such as unemployment, part-time work, or intermittent employment. Detailed analysis of the types of jobs held by graduates determines if **mismatched graduates were also more likely to experience unemployment, involuntary part-time employment or intermittent employment compared to matched graduates.**[13] Were the mismatched restricted to those who were unable to secure full-time jobs?

A final measurement issue is the extent to which mismatch can be considered a transitional problem. Did the rate of mismatch decline the longer these graduates remained in the labour market? Often, mismatch is viewed as a temporary, almost inevitable, phase of the transition from school to work, attributed to lower commitment to full-time employment, a need to explore alternatives, or a lack of maturity and experience (Osterman, 1980; Clogg, 1979). In Sullivan's words, the question is whether the underutilization of young inexperienced workers is a subsidy for work experience? (1978:173) There is a need, she declares, for "longitudinal research on employment histories...to establish the relationship of underutilization to the life cycle" (173). Though not directed specifically at the problem of underemployment, this is exactly the approach taken by the Study of Transitions from School to Work. Respondents were surveyed at the time of graduation so that data on their career and life expectations were not biased by their actual labour market experiences.

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[13] Note that part-time and intermittent employment are different forms of underemployment according to the L.U.F. framework discussed in Chapter 2.

Regardless of the explanation, if underemployment is a transitional problem, there should be considerable evidence of mobility from various states of underemployment to a matched state over the two year time-period analyzed. Thus, **the rate of mismatch will decline the longer graduates remain in the labour market.**

WHY WERE SOME GRADUATES MISMATCHED WHILE OTHERS WERE MATCHED?

The second part of the analysis of these data examines the relative impact of structural variants (labour market conditions, service sector employment) and individual variants (type of degree, socio-economic status, gender, age, attitudes and expectations, part-time work, and academic performance) on match status.

For this particular group of graduates, was there evidence of mismatch according to regional disparities in employment opportunities? Given the tremendous level of employment growth in Toronto during the mid to late 1980s, graduates working in this labour market should have experienced less underemployment than those working in Alberta or other depressed economic regions (Table 2). If, however, a considerable amount of underemployment is observed even in the most active labour markets, this would discredit the argument that mismatching is a consequence of cyclical demand fluctuations.

As discussed in Chapter IV, previous studies have shown that underemployment does not necessarily fluctuate with changes in local labour market conditions. Nevertheless, for this study, **mismatch rates are expected to be higher in areas of low labour market demand.**

The debate about the service sector and its impact on the changing quality of employment is also explored. Given current trends, many graduates will obviously be working in the service industries. Is there any indication, as Myles (1988) and others (Economic Council of Canada, 1987; Krahn and Lowe, 1990) have suggested, of a schism between good jobs and bad jobs among those employed in different sectors of the service industry? If so, how does this relate to underemployment? If occupational polarization has begun to occur, then one would expect to find **matched graduates entering jobs in the education, health, business and professional services while mismatched graduates are largely confined to jobs in the lower-tier of the services sector.**

TABLE 2

LABOUR FORCE DATA, TORONTO, EDMONTON

	TORONTO			EDMONTON		
	May 1985	May 1986	May 1987	May 1985	May 1986	May 1987
Pop. 15 yrs & older (000s)	2,510	2,544	2,597	550	563	564
Total labour force (000s)	1,783	1,841	1,869	397	409	419
Employed	1,669	1,735	1,784	347	360	372
Unemployed	114	106	85	50	49	48
Not in labour force (000s)	727	703	729	153	154	144
Labour force participation rate	71.0	72.4	71.9	72.3	72.6	74.4
Unemployment rate	6.4	5.8	4.6	12.5	12.6	11.3
Employment/population ratio	66.5	68.2	68.7	63.2	63.9	65.9

SOURCE: Statistics Canada, Cat. No. 71-001, The Labour Force, Table 53 and 104.

As far as individual characteristics (human capital) are concerned, to what extent do ascribed characteristics such as socio-economic status (S.E.S.), gender, ethnicity or age account for mismatch among this group of graduates? Usually people of lower S.E.S. origins, women, and ethnic minorities are at a disadvantage when competing for higher status jobs, not only due to discrimination, but also because these variables influence occupational choice and aspirations. According to existing research, however, these variables have little impact on mismatch rates since they affect educational occupational aspirations prior to entering university. V. Burris (1983) reported a tendency toward higher rates of underemployment among working class labour market participants at all levels of educational attainment, but no such evidence has emerged from other research.

Results vary, but several studies show women graduates are no more affected by underemployment than are male graduates (Rumberger, 1981; Burris, 1983; Harvey and Kalwa, 1983; Clogg and Shockey, 1984) and, at least in terms of initial labour market entry, derive greater returns on education. This evidence must be counterbalanced by research which highlights important ways in which gender affects career paths and outcomes for graduates (Marsden et al., 1975; Hughes, 1988).

Aggregate analysis of U.S. data provides little evidence of higher underemployment rates among college educated blacks versus whites, while the impact on other ethnic minorities has not been addressed.[14] Younger and older age cohorts are more vulnerable to mismatch compared to middle aged labour market participants (Clogg, 1979), but age differences within a specific age group, in this case 20-29, would not likely affect matching to any great degree.

Drawing from current research, it would be reasonable to hypothesize that **socio-economic status, gender, and age will not greatly influence prospects for matching** among this particular group of graduates.

The most important human capital asset is likely to be the type of degree these graduates obtained. To what extent did field of study (faculty) affect the likelihood of being mismatched?[15] According to evidence reviewed in Chapter IV, **graduates from general programs, such as Arts and Science, are expected to have higher rates of underemployment than**

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[14] Unfortunately, this study is unable to examine ethnicity in relation to underemployment since frequency distributions show less than 10% of respondents came from ethnic minority backgrounds.

[15] These data do not include information about field of study, a factor which would probably affect matching differences within faculties. Although major fields of study are often recognizable from job titles such as articling accountant or psychologist, for example, the small sample selected for this study would render such analysis largely impossible.

graduates from Engineering, Education and Business. Are inter-faculty differences as great as other studies suggest, and what do these data imply about generalist versus specific educational preparation? Is being matched simply a matter of selecting the right type of degree program? How important is this variable in relation to other factors influencing the matching process?

This analysis focuses on comparison between occupationally specific programs (Education, Business, Engineering) and general Arts and Science, examining various arguments about the rationality of job skill requirements and credentials. To what extent do matched or mismatched graduates perceive themselves as underemployed in terms of actual skill utilization and relatedness of educational preparation?

Another variable influencing match status may be academic achievement. Were graduates with higher marks more likely to be matched? Although type of degree is expected to have a stronger influence on match outcomes, is there any merit to the argument that those with higher intelligence or ability are less prone to mismatch (Becker, 1964; Gottfredson, 1987:138-40)? If employers use marks as a sign of intelligence or ability to perform job-related skills, then **graduates with the highest marks, across all faculties, would be least expected to be mismatched.** Underemployment, therefore, might be the fate of those who are less able or willing to work hard, just as a functionalist or human capital theorist would argue.

The 1985 questionnaire asked university graduates to estimate their final grade-point average. Based on a mean score of 70 for graduates from both universities, this variable was recoded into average and below marks (70, or stanine of 6, and under)=0 and above average marks (over 70)=1.

Along with academic achievement, part-time work experience while in school may affect a graduate's chances of finding a matched job. Today, students are counselled to find summer or part-time work related to the type of career they eventually want to enter, since employers look for some kind of related experience when screening graduates (Edmonton Journal, May, 1991). Yet despite the fact that most young people enter the labour market long before they graduate with post-secondary degrees, few university graduates find part-time work related to their field of study.

This issue is not part of the underemployment debate. However, it is considered to be a critical factor in studies of the school to work transition (Hoskins, Sung and Ashton, 1989; Lynch. 1987). Some claim part-time work while in school provides little meaningful work experience and detracts from academic performance (Greenberger and Steinberg, 1986), while others report it has negligible impact on subsequent employment status (Krahn and Lowe, forthcoming).[16]

A total of 62% of the university graduates in this study held a paying job while still in school (Krahn and Lowe, 1990a:6). However, since pre-graduate employment experiences are usually unrelated to the types of jobs or careers university students enter after they graduate **part-time employment during school is not expected to enhance matching prospects** for respondents in this study. Nevertheless, it is included in the analysis to test the hypothesis of null or little effect.

Finally, this study addresses the assumption of human capital theory that those with greater motivation or desire to achieve will get the better jobs or reap higher returns on their investment in education. Included in the category of attitudinal explanations are suggestions that mismatch is often a psychological response to unfulfilled expectations (Burris, V. 1983:464), or feelings of entitlement among educated workers (Burris, B. 1983:107-108).

Youth labour market outcomes, in particular, are often blamed on a lack of commitment to work, a poor work ethic in general (Johnson, 1986:37), or a need to try out different types of jobs before settling into longer term employment (Osterman, 1980). Thus, one might hypothesize that, even before they entered the labour market, **matched graduates were more achievement oriented, had a stronger commitment to work, and expressed career aspirations more closely aligned with their education compared to mismatched graduates.**

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[16] The literature on the effects of part-time work on labour market outcomes for youth is primarily concerned with the high school population.

This research examines the relative effects of attitudes and expectations on the matching process, relying on extensive data collected before these graduates entered the labour market. It considers the impact of attitudes on matching not only in relation to other individual characteristics, both ascribed (gender, socio-economic status, age) and achieved (marks, type of degree acquired), but also in relation to labour market conditions and the industrial sector where graduates were employed. While Question 2 concentrates on the determinants of mismatch, Question [illegible] is directed toward examining the consequences of mismatch and whether or not we should be concerned about differences in match status among university graduates.

WHAT WERE THE CONSEQUENCES OF BEING MISMATCHED COMPARED TO GRADUATES WHO WERE MATCHED?

This study compares detailed job profiles for matched and mismatched graduates from different faculties to identify patterns of labour market segmentation. Obviously graduates with degrees in Engineering and Education enter distinct career paths; however, are there such clear destinations for graduates with other types of degrees? Do matched and mismatched male and female graduates with the same degrees end up in similar jobs?

Generally, mismatch is expected to have a negative impact on earnings and job satisfaction, although the literature casts a shadow of doubt on this hypothesis (Rumberger, 1987; Shockey, 1989). Does this study indicate that **matched graduates have higher incomes than their mismatched cohorts?** Income differentials are assessed with particular attention to cross-faculty and gender differences to determine if graduates suffer economically as a result of being mismatched. Certainly, those who are working in lower level clerical and retail sales jobs will be earning less than graduates in professional occupations, but other mismatched jobs in higher level sales or management will probably pay as well or better than the professions, particularly teaching.

Are mismatched graduates any less satisfied with their jobs than matched graduates? Although some surveys suggest otherwise (Clark and Zsigmond, 1981), **graduates who are mismatched are expected to report lower levels of job satisfaction and evaluate their jobs less favourably than those who are matched** (Burris, V. 1983; Burris, B., 1983). In this study, respondents were not only asked the standard question, "How satisfied are you with your job?", but also to evaluate more specific dimensions of their job such as, "The work is interesting", "The chances for promotion are good", "I have the freedom to decide what I do in my job", and "The job gives me a feeling of accomplishment".

These statements provide greater insight on how graduates perceive their jobs than do the standard measures of overall job satisfaction. Generally, if mismatch has negative consequences for university graduates, this analysis should reveal how and why it affects their quality of employment.

Summary

The Study of Transitions from School to Work offers valuable data for answering questions and testing various hypotheses brought forward in the literature review on underemployment. The major strengths of this data set include its emphasis on structural and psychological factors affecting the passage from school into the labour force, the inclusion of graduates from two distinct regions in Canada and, most importantly, the collection of long-term panel data.

One of the research objectives for this study is to measure underemployment using the G.E.D. score as a guideline for identifying mismatch between educational attainment and job skill requirements. Although this method of measurement has been used to study changing job skill requirements and educational attainment with aggregate data, it has not been used in Canadian research specifically aimed at the problem of underemployment.

Furthermore, until the recent study by Myles and Fawcett (1990), no one had tested the validity of the G.E.D. method in relation to subjective measures of overeducation or underemployment. The analysis which follows, considers differences between these two types of measures on a number of crucial variables. In depth comparative analysis by match status, faculty, gender and industrial sector identifies how graduates are stratified into jobs of varying quality, thus contributing to the growing literature on labour market segmentation theory.

Another research objective is to examine causal inferences implied by the literature on underemployment. As is typical for much of the research on labour market outcomes, human capital theory is front and centre in the debate about underemployment, providing testable hypotheses about why some graduates are matched while others are not. To what extent do local labour market conditions explain match outcomes? Are individual factors such as educational choices, the motivation to achieve, attitudes toward work and expectations of future employment at the root of the underemployment problem, or do ascribed characteristics such as S.E.S., gender or age have relatively more influence over the matching process? What determines education-job match status for graduates with the same level of educational attainment and what does this imply about the structure of opportunity for these labour market entrants?

Finally this research examines some of the consequences of mismatched underemployment for graduates, concentrating specifically on differences in incomes and job satisfaction. Chapter II argued that regardless of actual or perceived consequences, the prevalence of mismatched underemployment is an important labour force indicator due to what it may signal about changing job skill requirements and the relationship between education systems and the labour market. Yet if there is no negative impact on pay or job satisfaction, the problem of underemployment may not be viewed as a highly salient issue in labour market research.

In sum, the following analyses contributes to a fuller understanding of mismatched underemployment from a theoretical, empirical and methodological point of view.

CHAPTER VI. THE EXTENT OF MISMATCH AND ITS CAUSES

The Overall Rate of Mismatch

The G.E.D. Score Measure

Chapter V described the sample of graduates selected for this study and explained the operationalization of the dependent variable, match status. Briefly, only those respondents who did not pursue full or part-time studies for more than two months after graduating from university were included in the sample (N=487). Only 8% (n=36) of these respondents were part-time employees in 1987, and because there numbers were small, they were included with full-time workers in subsequent analysis.[17]

The measure of match status (0=mismatched; 1=matched) was constructed using the General Educational Development Score assigned to 4-digit occupational codes in the Canadian Classification and Dictionary of Occupations (C.C.D.O, Vol. II., 1971). Since a G.E.D. score of 5 equates to a requirement for 16 years of schooling, graduates in jobs with a G.E.D. score of 4 or less were coded as mismatched.

Among 1985 graduates with bachelor's degrees from the universities of Alberta and Toronto, 35% were employed in jobs not requiring a degree two years after entering the labour market. As Table 3 illustrates, the rate of mismatch dropped slightly from 38% in 1985. However, while those who were matched in 1986 were also likely to be matched a year later, a considerable proportion of graduates moved from mismatched to matched status. By May, 1987 25.4% of those who were mismatched in May, 1986 moved into jobs with a G.E.D. score of 5 or more. A smaller percentage of graduates (10.6%) moved from the state of match to mismatch. These data indicate the rate of mismatch improved between the first and second year after labour market entry; however, more than one in three respondents were still employed in jobs that did not require the level of education credentials they possessed.

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[17] Most of these were working part-time involuntarily (i.e., 27 of these graduates said they would prefer full-time employment). The relationship between part-time work and underemployment will be examined later.

Table 4 shows the types of occupations in which the matched and mismatched graduates were employed. In 1987, the mismatched worked in clerical, sales and service jobs, while the matched were almost exclusively employed in professional occupations. Occupational status, according to mean Blishen scores, was significantly lower for the mismatched group (mean=43.9) compared to those in matched jobs (mean=63.6).

Table 4 also demonstrates why occupational categories can be misleading indicators of match status. For example, using the G.E.D. as a guideline for determining job requirements results in the matched and mismatched groups having equal proportions of graduates (18%) in managerial jobs. Matched respondents occupied managerial jobs requiring

TABLE 3

Match Status 1986, 1987

	1986		
	Mismatched %	Matched %	Total %
1987			
Mismatched	74.6	10.6	34.9
	(129)	(30)	(159)
Matched	25.4	89.4	65.1
	(44)	(253)	(297)
Total	37.9	62.1	100.0
N	(173)	(283)	(456)

* Differences between mismatched and matched groups are statistically significant (p<.01, Chi-square test).

TABLE 4

Occupation by Match Status, 1987

	Mismatched %	Matched %
Managerial	* 18.4 (29)	18.1 (54)
Science, Eng., Math,/ Med., Health	8.2 (13)	32.6 (97)
Social Sciences/Artistic Literary, Rec.	7.6 (12)	5.4 (16)
Teaching	--	43.3 (129)
Clerical	27.2 (43)	--
Sales	24.1 (38)	--
Service	7.6 (12)	.7 (2)
Primary, Manufacturing, Processing/Construction/ Transportation, Commun.	7.0 (11)	--
Total N	100.0 (158)	100.0 (298)

* Differences between mismatched and matched groups are statistically significant (<.01, Chi-square test).

professional training and expertise (i.e., managers of functions related to science, engineering, architecture, social science and medicine) while those in the mismatched group managed functions where on-the-job training and experience is more prevalent (i.e., managers of restaurants, distribution centres, printing services, advertising and sales managers). Thus, the 'match' variable is not one based solely on occupational status (i.e., professional/managerial versus other occupations) but on the general educational development requirements for the job. If underemployment were estimated as a percentage of those in professional/managerial jobs versus those in other job categories the rate would be 23.4%, 10% lower than the estimate using a more definitive measure of the education-job match.

Subjective Perceptions of Mismatch

Chapter III reviewed contrasting arguments about different ways of measuring underemployment. While researchers such as Clogg and Shockey (1984:240) claim that subjective measures tend to overestimate the problem of underemployment, O'Brien (1986:40-45) makes a case for the similarity between self-perception and external objective evaluations of underemployment. V. Burris (1983:457) is probably closer to the mark when he suggests that further inquiry is necessary to determine the relationship between these two different types of measures. How well do objective and subjective measures correlate for these data?

The two subjective measures, "The job (present) lets me use my skills and abilities" and "The job (present) is directly related to my education and training" are scaled from 1= Strongly Disagree to 5=Strongly Agree. Since the distribution of responses on these variables is skewed toward the positive end, it would be reasonable to include those choosing the middle value (response category 3) with those respondents who disagreed with the above statements (i.e., those who would be considered mismatched on these subjective measures).

For the subjective indicator "My job lets me use my skills and abilities" the mismatch rate (those who disagree) is 35%, almost exactly the same as the rate of mismatch determined by the G.E.D. methods.[18] Thus, in terms of the percentage of respondents labelled as mismatched, the objective (G.E.D.) and subjective measures provide similar results. The mismatch rate is somewhat higher (40%) using the measure "My job is directly related to my education and training."

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[18] The discrepancy between the two types of measures varies depending on how the two subjective indicators of mismatch are coded. If the value 3 is included with those who agree, only 16.9% say the job does not utilize their skills and abilities, while 26.1% report their job is not directly related to their education and training.

However, the more important question is whether these alternative measures are correlated. Crosstabulations (using the three main response categories for the subjective measures) indicate there is a very strong and significant relationship between the subjective measures of mismatched underemployment and the G.E.D. measure developed for this study (Table 5). The majority of G.E.D. matched graduates (77%) agreed they utilized their skills on the job, whereas less than half the mismatched graduates agreed with this statement (41%). Those who were matched were also far more inclined to think their job was related to their education and training (81%) compared to the mismatched group (22%).

In short, the subjective and objective measures of mismatch examined in this study produce similar estimates of underemployment and are also strongly correlated with one another.

Factors Determining Match Status (Bivariate Analysis)

As outlined in Chapter IV, explanations of underemployment tend to fall into a structural or a psychological category. This research examines both types of explanations within the limitations of the available data. Cross-cohort analysis, for instance, is not possible. Hence, the structural effects of changing demographic profiles on mismatch cannot be studied with these data. The inclusion of graduates from Edmonton and Toronto, however,

TABLE 5

Comparing Objective and Subjective Measures of Mismatch, 1987

	Job G.E.D. score		Total
	<5	5 or 6	
	%	%	%
Subjective measures:			
a) "The job lets me use my skills and abilities."			
% disagree	* 58.9	22.9	35.4
	(93)	(68)	(161)
% agree	* 41.1	77.1	64.6
	(65)	(229)	(294)
	100.0	100.0	100.0
	(158)	(297)	(455)
b) "The job is directly related to my education and training."			
% disagree	* 77.8	19.1	39.5
	(123)	(57)	(180)
% agree	* 22.2	80.9	60.5
	(35)	(241)	(276)
Total	100.0	100.0	100.0
N	(158)	(298)	(456)

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* Relationships between the objective and subjective measures are statistically significant (p<.01), Chi-square test).

will allow labour market conditions to be examined as a structural variable.

This study also investigates how individual characteristics or human capital affects match outcomes for graduates. What is the relative importance of 'ascribed' characteristics such as socio-economic status and gender compared to 'achieved' characteristics such as choices about program of study, or attitudes and expectations about education and work?

For each of the variables considered in the following analysis, bivariate relationships with match status will be carefully examined before a multivariate model is developed.

Ethnicity and Age

Neither age nor ethnicity figure prominently in this study due to the nature of the sample. Less than 10% of the respondents could be categorized as being part of an ethnic minority, thus there is insufficient variation in the sample to allow for analysis of this variable and its effect on matching.

The age variation in this sample is limited by the removal of older graduates from the larger data base it is drawn from. Graduates born before 1955 were eliminated because the Transitions from School to Work Study was designed to focus on youth. Thus, the average graduate in this sample was 26 years of age in 1987, 24 in 1985.

According to Clogg (1979) the relationship between age and underemployment is curvilinear with mismatch rates being very high at younger ages, declining through early adulthood and middle age, then rising again in older age (196). Thus, even though this sample does not include graduates over 30 years of age, it is possible that age might have a significant effect on mismatch. Respondents who were in their mid- to late 20s might have been more likely to get a matched job, either because of previous job experience or employers' preferences for maturity.[19] Crosstabulations show those over 25 years of age were slightly, though not significantly, less likely to be mismatched (33%) compared to younger respondents (36%). Though age was included in later multivariate analysis, it can already be seen to have only a minimal effect on matching, at least for this particular group of graduates.

Socio-economic Status (S.E.S.) and Mismatch

Recent studies of status attainment in Canada have revealed that parents' ethnicity, education, and occupation, together with human capital factors such as educational achievement, work experience, and labour market conditions, explain a great deal of the variation in occupational status attainment. Yet emphasis has shifted toward gender and class relations since these variables influence labour market outcomes long before young people reach the post-secondary education level (Brym and Fox, 1989).

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[19] It is possible that some of the older graduates had obtained previous post-secondary educational credentials prior to entering the degree programs they graduated from in 1985. However, since graduates born before 1955 were eliminated from the total Transition from School to Work sample, it is doubtful that the mature graduates remaining would have accumulated graduate degrees or lengthy job experience.

Nevertheless, even after acquiring degrees, it might be argued that graduates from a lower socio-economic background are at greater risk of underemployment because they lack the contacts or encouragement necessary to pursue a professional or managerial job. Although respondents in this sample are predominantly white and middle-class, there is sufficient variation on other key indicators of socio-economic status.

Investigation of the relationship between mismatch and parents' occupation, educational attainment and parents' financial situation revealed non-significant results.[20] Cross-tabulation analysis confirmed that neither father's nor mother's educational attainment had a significant effect on faculty choice or subsequent match status (Table 6).

Even father's occupational status bore no significant relationship to respondent's occupational or mismatch status in bivariate analysis. Cross-tabulation of father's

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[20] Parents' financial situation was measured by asking a forced choice question "How would you describe your parent's financial situation: Poverty level, somewhat below average, average, somewhat above average or wealthy?

TABLE 6

Match Status by Parents' Level of Educational Attainment

	Father's Education				
	Level 1	Level 2	Level 3	Level 4	Total
	%	%	%	%	%
Mismatched	32.7	32.4	33.7	40.2	34.9
	(49)	(23)	(34)	(49)	(155)
Matched	67.3	67.6	66.3	59.8	65.1
	(101)	(48)	(67)	(73)	(289)
Total	100.0	100.0	100.0	100.0	100.0
N	(150)	(71)	(101)	(122)	(444)
	Mother's Education				
Mismatched	31.8	35.3	36.5	35.8	34.7
	(42)	(42)	(46)	(24)	(154)
Matched	68.2	64.7	63.5	64.2	65.3
	(90)	(77)	(80)	(43)	(290)
Total	100.0	100.0	100.0	100.0	100.0
N	(132)	(119)	(126)	(67)	(444)

Level 1=less than high school
Level 2=high school (Grade 12 or equivalent)
Level 3=some post-secondary schooling
Level 4=university degree

Differences between in mismatch across parents' educational attainment groups are statistically non-significant (p>.05, Chi-square test).

occupational status with the match variable showed 63% of graduates whose fathers were professionals or managers were matched in 1987, compared to 69% of those whose fathers were in lower status occupations (see Table 7). Using Blishen scores as an alternative indicator, there was no significant difference in father's occupational status between matched (mean=54) and mismatched graduates (mean=52).

In short, socio-economic background has no significant effect on matching, partly due to the selection of university graduates to begin with, and further by the elimination of those who went on to obtain higher credentials rather than entering the labour market after obtaining an undergraduate degree.[21]

Faculty Differences

Among graduates with the same level of education (i.e., a bachelor's degree) the type of degree or program chosen appears to be the best predictor of underemployment. Clearly, those who choose occupationally-specific programs in university are more likely to find jobs which match their educational qualifications (Table 8).

For instance, both Education and Engineering graduates had significantly lower rates of underemployment. Slightly

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[21] It is quite likely that those who went on to post-graduate programs, including high status professional programs such as medicine and law, came from higher socio-economic backgrounds.

TABLE 7

Match Status by Father's Occupational Status, 1987

	Professional/Managerial	Other	Total
	%	%	%
Mismatched	37.1 (62)	31.2 (89)	34.4 (151)
Matched	62.9 (151)	68.8 (137)	65.6 (288)
Total	100.0 (213)	100.0 (226)	100.0 (439)

Differences between professional/managerial and other occupational groups are statistically non-significant (p>.05, Chi-square test).

TABLE 8

Match Status by Faculty, 1987

	Arts	Bus.	Educ.	Eng.	Sci.	Total
	%	%	%	%	%	%
Mismatched *	69.4 (77)	32.9 (24)	10.4 (14)	16.9 (11)	45.2 (33)	34.6 (159)
Matched *	30.6 (34)	67.1 (49)	89.6 (121)	83.1 (54)	54.8 (40)	65.1 (298)
Total N	100.0 (111)	100.0 (73)	100.0 (135)	100.0 (65)	100.0 (73)	100.0 (457)
	[24.3]	[16.0]	[29.5]	[14.2]	[16.0]	

*Differences between faculties are statistically significant (p<.01), Chi-square test).

[] % of graduates from each faculty

below the average rate of mismatch for all respondents were Business graduates at 32%, while Arts faculties had the highest rate of underemployment with 69% of their graduates working in jobs not requiring a university degree. Although this is a startling statistic, the more unexpected finding is the relatively high rate of mismatch (45%) among Science graduates. If there is such a critical shortage of people with scientific knowledge and training (Canadian Chamber of Commerce, 1988:29) why are so many science graduates underemployed?

Another interesting observation is that exclusion of Education and Engineering graduates from the sample increased the overall rate of mismatch to 56%. This indicates the tremendous effect of the two most occupationally-oriented faculties on reducing underemployment among university graduates.

Further breakdown of fields of study, particularly within Arts and Science, would help to explain variations in match status. For example, one might predict an English major would be more likely to experience underemployment compared to an Arts graduate specializing in an applied subject area such as social work or economics. However, with this particular sample, case numbers would be too small to conduct an analysis by field of study. With close to 70% of Arts graduates underemployed, it is doubtful that a larger proportion of variance could be explained by the introduction of field of study as a variable.

Finally, examination of faculty differences in subjective underemployment reveal somewhat less variation. Specifically, perceptions of mismatch are greater than objective mismatch rates for graduates from the professional faculties (Business, Education, and Engineering) yet lower than objective mismatch rates for Arts and Science graduates (Table 9). For example, although 69% of the Arts graduates were mismatched according to G.E.D. scores, only 51% thought their jobs did not allow them to use their skills and abilities. On the other hand, 44% of Business graduates said their jobs did not utilize their skills and abilities while only 33% were actually mismatched. Subjective underemployment was also greater than objective rate mismatch for Education and Engineering graduates, although the majority of Education graduates (80-85%) agreed with the statements about on-the-job skill-utilization and relevance of training.

Since respondents had been out of school for only two years at the time they answered these questions, on-the-job training and development may still be underway. Yet the fact that 30-45% of graduates with so called 'applied' degrees in Business and Engineering say they were not using their knowledge, skills and abilities on the job, may have important implications for theories of credentialism and the

TABLE 9

Subjective Perceptions of Match by Faculty, 1987

		Arts	Bus.	Educ.	Eng.	Sci.	Total
		%	%	%	%	%	%
1) "Job lets me use my skills and abilities."							
Disagree	*	51.4	44.4	20.7	35.4	30.1	35.5
		(57)	(32)	(28)	(23)	(22)	(162)
Agree		48.6	55.6	79.3	64.6	69.9	64.5
		(54)	(40)	(107)	(42)	(51)	(294)
Total		100.0	100.0	100.0	100.0	100.0	100.0
						N	(456)
2) "Job is directly related to education and training."							
Disagree	*	65.2	43.1	15.6	36.9	42.5	39.4
		(73)	(31)	(21)	(24)	(31)	(180)
Agree		34.8	56.9	84.4	63.1	57.5	60.6
		(39)	(41)	(114)	(41)	(42)	(277)
Total		100.0	100.0	100.0	100.0	100.0	100.0
						N	(457)

*Differences between faculties are significant (p<.01, Chi-square test).

skilling debate. Is there a legitimate basis for requiring a Business or Engineering degree for some of these jobs? Have technological advances in such areas as computer aided design and office automation eliminated some of the traditional functions of engineering or management? These issue will emerge again when detailed occupational profiles are examined in Chapter VII.

Gender Differences

Studies of both Canada and the U.S. reveal few gender differences in mismatch underemployment status, particularly among college or university graduates (Harvey, 1974; Rumberger, 1981; Clogg and Shockey, 1984; Clark et al., 1986). Results from these data show that 37.2% of the female graduates were mismatched compared to 31.6% of the males. Females in this sample were slightly more disadvantaged compared with males, but the difference was not statistically significant (Table 10).

However, as previous analysis of Edmonton data indicates (Hughes, 1988), it is necessary to look at differences between males and females with the same level and kind of educational preparation to determine exactly how gender influences labour market outcomes. The majority of female graduates in this sample (73%) chose education and arts while only 27% graduated in science, engineering and business combined. Males displayed the opposite tendency, 71% of them graduating from the faculties of science,

TABLE 10

Mismatched by Sex by Faculty, 1987

	Female	Male	Total
	%	%	%
Mismatched			
All Graduates	37.2 (97)	31.6 (62)	34.8 (159)
Within Faculties:			
Arts	70.5 (55)	66.7 (22)	69.4 (77)
Business	38.7 (12)	28.6 (12)	32.9 (24)
Education	11.5 (13)	4.5 (1)	10.4 (14)
Engineering	-	19.0 (11)	16.9 (11)
Science	53.1 (17)	39.0 (16)	45.2 (33)

Differences between females and males in the total sample, and within each faculty are statistically non-significant ($p>.05$, Chi-square test).

engineering and business compared to 29% from arts and education (Table 11).

Clearly, gender differences in educational and occupational choices are influenced prior to entering university. However, because gender has a strong influence on occupational aspirations prior to educational choice, intra-faculty differences may be concealed in the overall rates of mismatch.

This does not appear to be the case. For faculties dominated by one sex such as Education (83% female) and Engineering (89% male) graduates of the opposite sex were at no greater risk of being mismatched (Table 11). Even among Arts graduates, where females vastly outnumbered males, the difference in mismatch is non-significant, although men had a somewhat lower rate of mismatch (67%) than women (71%). Similarly, comparisons between male and female graduates from Business and Science faculties yielded no significant variation, although women with Science degrees were considerably more likely to be underemployed (53%) compared to men with the same degree (39%). Thus, faculty is clearly the critical variable in determining education-job match.

Do measures of subjective perceptions of underemployment reveal differences between male and female graduates? Again, these data indicate women were no more likely to view their education and training as unrelated to their jobs than were males, nor were they less inclined to

TABLE 11

Faculty of Graduation by Sex

	Female	Male	Total
	%	%	%
Arts *	30.9	18.2	25.5
	(86)	(38)	(124)
Business	12.2	20.1	15.6
	(34)	(42)	(76)
Education	42.4	10.5	28.7
	(118)	(22)	(140)
Engineering	2.5	30.1	14.4
	(7)	(63)	(70)
Science	11.9	21.1	15.8
	(33)	(44)	(77)
Total	100.0	100.0	100.0
	(278)	(209)	(487)

*Differences between females and males are statistically significant (p<.01, Chi-square test).

(Table 12). One might reasonably conclude, then, that females, regardless of the type of undergraduate degree acquired, are as likely to be matched as their male counterparts with equivalent education. Yet from what is known about gender, university graduates and labour market outcomes, income discrepancies and differences in specific kind of work would be expected (Marsden et al., 1975; Wannell, 1990). Further in the analysis, such variables will be considered when consequences of underemployment for males and females are examined.

Possibly multivariate analysis controlling for other variables such as labour market conditions, part-time versus full-time employment, attitudes toward work and career orientations may reveal indirect or interaction effects of gender and matching. The primary effect of gender, however, appears to occur through faculty selection. Women tend to enter careers such as teaching, traditionally dominated by women and this increases their probability of being matched.

Variations in Labour Market Conditions

Local labour market conditions, as indicated by seasonally adjusted (or unadjusted) unemployment rates, do not seem to be related to underemployment among this group of graduates. To examine the effect of labour market conditions, the variable indicating where respondents were living (and presumably working) two years after graduation

TABLE 12

Subjective Perceptions of Match by Sex, 1987

	Female %	Male %	
1) "Job lets me use my skills and abilities."			
Disagree	37.9 (98)	41.3 (64)	
Agree	62.1 (162)	58.7 (115)	
Total	100.0 (261)	100.0 (196)	N (457)
2) "Job is directly related to education and training."			
Disagree	37.5 (98)	32.8 (64)	
Agree	62.5 (163)	67.2 (131)	
Total	100.0 (261)	100.0 (195)	N (456)

Differences between females and males are statistically non-significant ($p>.05$, Chi-square test).

was recoded into a binary variable. Locations with a seasonally unadjusted unemployment rate of 8% or above were classified as 'unfavourable labour markets' and those with a rate under 8% were considered 'favourable labour markets'.[22] Most of the respondents ended up working in the city where they had attended university. In May 1987, the unemployment rates for these cities were 11.4% (Edmonton) and 4.6% (Toronto).[23] Results presented in Table 13 show graduates working in Edmonton were no more likely to be underemployed than those located in Toronto.

When all local labour market locations were categorized as favourable or unfavourable, there were again no significant differences between the matched and mismatched. In fact, a larger percentage of those working in favourable labour markets were mismatched rather than matched (Table 13). This prompts questions about the competition for 'good jobs' in a 'boom' economy such as Toronto, where one would expect graduates to have a greater range of opportunities to be matched. Possibly some graduates working in the Toronto labour market might have been

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[22] This cut-off point was based on the fact that many economists consider an unemployment rate of 5-6% to be negligible whereas rates higher than 8% are usually newsworthy.

[23] Edmonton and Toronto represent the highest and lowest unemployment rates among all locations reported. Also, when compared with the national rate of 8.9% for May, 1987, it is logical to refer to Edmonton as having 'unfavourable' and Toronto 'favourable' labour market conditions.

TABLE 13

Match Status by Local Labour Market Conditions, May, 1987.

	Edmonton	Toronto
	%	%
Mismatched	42.0	40.5
	(63)	(62)
Matched	58.0	59.5
	(87)	(91)
Total	100.0	100.0
N	(150)	(153)

	All locations	
	# Unfavourable	Favourable
	%	%
Female		
Mismatched	31.5	44.3
	(46)	(51)
Matched	68.5	55.7
	(100)	(64)
Total	100.0	100.0
	(146)	(115)
Male		
Mismatched	32.2	30.7
	(39)	(23)
Matched	67.8	69.3
	(82)	(52)
Total	100.0	100.0
N	(121)	(75)

Differences between Edmonton and Toronto, unfavourable versus favourable labour market conditions, and males and females within unfavourable or favourable labour markets are statistically non-significant ($p>.05$, Chi-square test).

# All cities where respondents resided were coded as unfavourable (seasonally unadjusted unemployment rate 8% and above) or favourable (seasonally unadjusted unemployment rate of less than 8%)

attracted to jobs in advertising or sales by the potential for higher earnings. Toronto may have also drawn graduates from other parts of the country making competition for higher level jobs much tougher.

The relationship between labour market conditions and underemployment may be worth exploring further, particularly in relation to gender differences. Ascribed characteristics might play a more significant role in the selection process when labour market conditions are unfavourable (Goyder, 1980; Blakely and Harvey, 1988:37). Table 13 provides little evidence for this hypothesis. In fact, females in this particular sample were somewhat more likely to be mismatched where labour market conditions were favourable, although the gender difference is non-significant. It may be that jobs for graduates in unfavourable labour markets tended to be in the public sector where females were in a better competitive position. Comparisons of job outcomes and labour market segments will be pursued below.

Overall, it seems local labour market conditions, estimated according to unemployment rates, had little effect on underemployment among this group of graduates. But again, this relationship should be tested through multivariate analysis where other variables can be controlled simultaneously.

Working in the Service Sector

As discussed in earlier chapters, the rapid shift toward service sector employment in Canada has heightened concerns about the quality of employment in this sector of the economy (Economic Council of Canada, 1990; Foot and Venne, 1990). Sectorial analysis is also a key feature of labour market segmentation theory and has proved to be highly useful in the study of youth labour markets (Ashton, et al, 1990).

As Myles (1988) points out, industries in the service sector must be differentiated from one another since they are characterized by varying levels of skill and employment conditions. For example, many professional and managerial jobs are located in the business or professional services; education, health and welfare; or public administration, all considered to be part of the service sector. Table 14 confirms that 63% of the graduates in this study were employed in this so-called upper-tier of the service sector while only 10% worked in the lower-tier consumer services (food and beverage, accommodation and personal service industries).

Consumer services had the highest proportion of mismatched graduates (86%) indicating that graduates who find employment in this sector of the economy have a very small chance of being matched. Yet those working in upper-tier service industries, other than education, health and

TABLE 14

Match Status, 1987 by Industrial Sector Location

	Industrial Sector					
	Goods	Dist.	Cons.	Bus.	Ed.He.	Pub.
	%	%	%	%	%	%
Mismatched *	29.8	64.0	85.7	40.5	10.8	44.0
	(28)	(16)	(42)	(33)	(17)	(22)
Matched	70.2	36.0	14.3	59.3	89.2	56.0
	(66)	(9)	(7)	(48)	(140)	(28)
Total	100.0	100.0	100.0	100.0	100.0	100.0
All Graduates	20.6 (94)	5.5 (25)	10.7 (49)	17.8 (81)	34.4 (157)	11.0 (50)

Source: Industrial categories from Myles et. al., (1988).

*Differences between industrial sectors are statistically significant.

welfare, were by no means immune from mismatch. For instance, over 40% of graduates who found work in the business services, and public administration sectors were in jobs not requiring a university education, while 30% of graduates employed in goods producing industries were underemployed. As is most evident in the low rate of mismatch for education, health and welfare services (11%), the effect of industrial sector on mismatch is influenced by the strong correlation between faculty of graduation (i.e., Education), occupational destination (teaching), and the service sector where one is more likely to be employed. This relationship will be explored further in multivariate analysis.

Working While in University

University graduates may acquire work experience during term breaks, or in some cases, through co-operative work experience programs. Paid employment in the last 9 months of school was very prevalent (61%) among the group of graduates selected for this study. Matched graduates were somewhat less likely to have worked in their last year of study, but the difference was non-significant in bivariate analysis (Table 15).

Engineering graduates, perhaps due to the time demands of their program, were far less likely to have paid employment while in school (43%) than respondents from other

TABLE 15

Match Status, 1987 by Working While in University, 1985

	Had paying job in the past 8 months (since university started):		
	No	Yes	Total
	%	%	%
Mismatched	31.0 (54)	37.4 (105)	34.9 (159)
Matched	69.0 (120)	62.6 (176)	65.1 (296)
All respondents	38.2 (174)	61.8 (281)	100.0 (455)

Differences between respondents who worked and those who did not were statistically non-significant (p>.05, Chi-square test) within both mismatched and matched groups.

faculties. However, within each faculty, graduates who worked were no more or less prone to matching than those who did not work. Working while in university, then, had no significant impact on subsequent match status.

Academic Achievement

Were graduates with the highest grades in their last year of university less likely to be mismatched? According to these data, 74% of the respondents with an above average grade-point average (G.P.A.) found jobs requiring a degree, compared to 57% of those with marks equal to or below the mean G.P.A. for this group of graduates (Table 16). This difference is statistically significant. A higher percentage of those with above average marks were matched no matter what faculty was considered. However, differences by academic standing were statistically significant only for Education and Science, but not Arts, Business or Engineering (because of small sample sizes).

There are several possible explanations for the relationship between marks and matching. Those with a higher academic standing may have specialized in areas where demand for graduates is high; employers hiring Education or Science graduates may place greater emphasis on marks in the selection process; or graduates with higher marks may present themselves better in an interview, or be more highly motivated in seeking a matched job. One could make a fairly

TABLE 16

Match Status, 1987 by Marks in University, 1985

	Grade-point Average	
	Average and below	Above average
	%	%
* TOTAL	53.6	36.4
	(236)	(204)
Mismatched	42.8	26.0
	(101)	(53)
Matched	57.2	74.0
	(135)	(151)
ARTS		
Mismatched	76.5	64.8
	(39)	(35)
Matched	23.5	35.2
	(12)	(190)
BUSINESS		
Mismatched	39.5	20.7
	(17)	(6)
Matched	60.5	79.3
	(26)	(23)
* EDUCATION		
Mismatched	18.0	4.4
	(11)	(3)
Matched	82.0	95.6
	(50)	(65)
ENGINEERING		
Mismatched	24.2	10.0
	(8)	(3)
Matched	75.8	90.0
	(25)	(27)
* SCIENCE		
Mismatched	54.2	26.1
	(26)	(6)
Matched	45.8	73.9
	(22)	(17)

Self-reported grade point average was recoded into a binary variable (0=average and below; 1=above average) based on the distribution of scores around the mean score for all graduates (70.2).

*Differences between respondents with average or below average marks and those with above average marks are statistically significant ($p<.05$, Chi-square test).

accurate prediction of match by knowing a graduate's academic standing during the last year of university. However, multivariate analysis is necessary to determine if marks have a significant effect on match outcomes regardless of gender or faculty of graduation.

Attitudes and Expectations About Education and Work

Often labour market outcomes are attributed to individual attitudes toward work as is evident in the literature on explanations of unemployment (Ashton and Maguire, 1986; Furnham, 1984; Feather, 1982). Lack of labour force commitment, for example, has been examined in the context of youth unemployment (Osterman, 1980). It is usually argued that many young people need some time to make the transition from school to work either to pursue other interests, or to explore different career opportunities.

Psychological factors such as employment commitment, and motivation to achieve are also potentially viable explanations of underemployment and quite compatible with human capital and structural functional theoretical perspectives on this problem. Similarly, attitudes of entitlement (belief that one is entitled to a job) have been linked with both youth unemployment and underemployment (Derber, 1978). Although generally viewed as a consequence of underemployment (having possible implications for a growing radicalization of youth), job entitlement may also contribute to perceived underemployment. If individuals look to society rather than their own initiatives to find a job, they might have a tendency to be less career-directed in making educational choices, or less aggressive in finding a job commensurate with their qualifications.

Thus, motivation and attitudes toward work should be considered as plausible factors in determining who ends up matched and mismatched in the competition for jobs among the university educated. Findings from the Study of Transitions from School to Work, however, make it difficult to argue that attitude differences play a major role in determining match outcomes. Measures of work values or work ethic previously used in surveys of the Canadian population (Burstein et al., 1975:91-93) indicate that respondents who remained in the work force after graduation had fairly traditional values toward work as well as a serious commitment to employment at the time they left school. Less than 5% said they would rather collect welfare than work at a job they did not like, and only 14% disagreed with the statement, "I am not ready for a long-term commitment to a job" (Krahn and Lowe, 1991:157).

At the time of graduation, less than one-half of the university respondents, who subsequently stayed in the work force, believed they were entitled to a good job or a job related to their education and training. However, they were less convinced of these beliefs than the high school cohort

(Krahn and Lowe, 1991:162). Thus, feelings of entitlement were not as strong as might be expected for those who had made a substantial investment in educational qualifications.

Frequency distributions on attitude variables for the group of graduates studied herein, generally follow a similar pattern of response. Prior to graduation, almost 70% disagreed with the statement, "I am not ready for a long-term commitment to a job"; whereas, slightly less than half agreed with the statements about job entitlement. The percentage of those who agreed in 1985 that they were not ready or were unsure about making a long-term commitment to a job (30.4%) is suspiciously close to the proportion of underemployed graduates in 1987. Hence, it might be assumed that the underemployed individuals were the same ones who were still searching out other interests or were undecided about what career direction they wished to take.

Further empirical analysis of these data, then, may reveal significant differences in attitude between those who ended up matched versus those who became mismatched. First, it is useful to confirm that responses to attitude and belief statements within the sample in question were well correlated with each other over time. In other words, are these reliable measures? Pearson correlations on readiness for long-term job commitment, feelings of job entitlement, or belief in the achievement ethic, measured at the three different time periods are positive and moderate in strength (ranging from .32 to .67). Thus, responses were fairly consistent over 1985-87 time period.

When response categories were recoded into 'Agree', 'Disagree' and 'Uncertain' (value 3 on the 5-point scale) a significant relationship was observable between "job commitment" at the time of graduation and matching two years later (Table 17). Those who had agreed in 1985 they were not ready for a long-term job commitment were less likely to be matched in 1987 (47%) compared to those who said they were ready for a commitment (68%) and those who were uncertain (69%).

Differences in job commitment might be expected to vary according to the professional orientation of the degree acquired. Table 18 indicates that Arts graduates were somewhat less ready to commit than those in the other faculties, with Education graduates being most ready to commit. Yet differences in response across faculties were non-significant as were differences between males and females (Table 18).

Gender differences were significant as far as attitudes of entitlement were concerned (Table 18) although there were no significant differences between matched and mismatched respondents (Table 17). The relationship between women graduates and feelings of entitlement is probably partly explained by the high proportion of women in Education (the most occupationally specific faculty). However, the

TABLE 17

Match Status, 1987 by Job Commitment, Job Entitlement, Achievement Ethic Prior to Graduation, 1985

	Disagree	Uncertain	Agree	
	%	%	%	
1) I am not ready for a long-term commitment to a job				
Mismatched	*31.6	31.0	52.9	
	(100)	(22)	(37)	
Matched	68.4	69.0	47.1	
	(216)	(49)	(33)	
All respondents	69.1	15.5	15.3	100.0
	(316)	(71)	(70)	(457)
2) JOB ENTITLEMENT				
a. If someone worked hard in school, they are entitled to a good job				
Mismatched	39.3	30.7	34.0	
	(48)	(39)	(70)	
Matched	60.7	69.3	66.0	
	(74)	(88)	(136)	
All respondents	26.8	27.9	45.3	100.0
	(122)	(127)	(206)	(455)
b. Everyone has the right to a job that their education and training has prepared them for				
Mismatched	31.3	34.5	37.1	
	(41)	(39)	(78)	
Matched	68.7	65.5	62.9	
	(90)	(74)	(132)	
All respondents	28.9	24.9	46.3	100.0
	(131)	(113)	(210)	(454)

Continued.....

	Disagree	Uncertain	Agree	
3) ACHIEVEMENT ETHIC				
a. Those who are always trying to get ahead in life will never be happy				
Mismatched	34.1	34.8	37.9	
	(103)	(32)	(22)	
Matched	65.9	65.2	62.1	
	(199)	(60)	(36)	
All respondents	66.8	20.4	12.8	100.0
	(302)	(92)	(58)	(452)
b. You should always try to improve your position in life rather than accept what you have now.				
Mismatched	35.4	40.0	31.5	
	(35)	(48)	(74)	
Matched	64.6	60.0	68.5	
	(64)	(72)	(161)	
All respondents	21.8	26.4	51.8	100.0
	(99)	(120)	(235)	(454)

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* Differences between response categories were statistically significant (p<.05, Chi-square test).

TABLE 18

Job Commitment, Job Entitlement, and Achievement Ethic by Faculty and Sex, 1985.

	Faculty					Sex	
	Arts	Bus.	Educ.	Eng.	Sci.	Female	Male
	%	%	%	%	%	%	%
1) I am not ready for a long-term commitment to a job.							
Disagree	63.7	68.4	75.7	71.4	67.5	[71.2	67.5
Uncertain	16.1	15.8	13.6	15.7	14.3	[15.1	14.8
Agree	20.2	15.8	10.7	12.9	18.2	[13.7	17.7
Total	100.0	100.0	100.0	100.0	100.0	[100.0	100.0
	(124)	(76)	(140)	(70)	(77)	(278)	(209)
						N (487)	
2) a. If someone worked hard in school, they are entitled to a good job.							
Disagree	39.9	29.3	20.7	31.4	26.0	[*21.2	34.8
Uncertain	28.5	28.0	27.1	28.6	22.1	[28.8	24.6
Agree	40.7	42.7	52.1	40.0	51.9	[50.0	40.6
Total	100.0	100.0	100.0	100.0	100.0	[100.0	100.0
	(123)	(75)	(140)	(70)	(77)	(278)	(207)
						N (485)	
b. Everyone has the right to a job that their education and training has prepared them for.							
Disagree	31.7	34.2	27.9	26.5	20.8	[*23.7	35.0
Uncertain	25.2	32.9	25.0	25.0	18.2	[26.3	23.8
Agree	43.1	32.9	47.1	48.5	61.0	[50.0	41.3
Total	100.0	100.0	100.0	100.0	100.0	[100.0	100.0
	(123)	(76)	(140)	(68)	(77)	(278)	(206)
						N (484)	

	Arts	Bus.	Educ.	Eng.	Sci.	Female	Male
	%	%	%	%	%	%	%
3) a. Those who are always trying to get ahead in life will never be happy.							
Disagree	67.2	71.1	67.1	65.2	66.7	[66.3	68.9
Uncertain	18.0	15.8	21.4	26.1	18.7	[21.7	17.5
Agree	14.8	13.2	11.4	8.7	14.7	[12.0	13.6
Total	100.0	100.0	100.0	100.0	100.0	[100.0	100.0
	(122)	(76)	(140)	(69)	(75)	(276)	(206)
						N	(482)
b. You should always try to improve your position in life rather than accept what you have now.							
Disagree	24.0	21.0	23.6	20.3	22.1	[*25.1	19.2
Uncertain	24.8	22.4	34.3	21.7	16.9	[28.4	21.6
Agree	51.2	56.6	42.1	58.0	61.0	[46.5	59.1
Total	100.0	100.0	100.0	100.0	100.0	[100.0	100.0
	(121)	(76)	(140)	(69)	(77)	(275)	(208)
						N	(452)

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*Differences between females and males are statistically significant (p<.05, Chi-square test).

possibility that a women, in general, input more from their education credentials cannot be discounted. Variation between faculties was non-significant and inconclusive as to whether graduates from professional degree programs or general programs had stronger beliefs in entitlement. Students from Science faculties, for instance, agreed somewhat more with the statement about being entitled to a job they were educated for than graduates from other faculties.

Self-report attitude measures of achievement orientation were not significantly associated with mismatch for the total sample or within different faculties (Tables 17 and 18). Graduates from professional faculties expressed no stronger affinity for the achievement ethic. Compared to graduates from other faculties, gender differences were apparent for one of the indicators, "You should always try to improve your position in life rather than accept what you have now". Males were more inclined to agree with this statement than females, although both tended to respond positively.

Another relevant measure of attitude is motivation for pursuing post-secondary education. Presumably, those who chose less occupationally-oriented degree programs were less directed toward a specific job or being matched. In fact, those who reported choosing their faculty for job or career reasons were less likely to be mismatched (24%) compared

TABLE 19

Reason for Choosing Faculty by Match Status, 1987

	Reason for Choosing Faculty	
	Job	Other
	%	%
Mismatched	* 23.6 (34)	40.3 (118)
Matched	76.4 (110)	59.7 (175)
Total	100.0	100.0
N	(144)	(293)

*Differences between those choosing a faculty for job versus other reasons are statistically significant (p<.01, Chi-square test).

Reason for choosing faculty was an open-ended question which was recoded into a binary variable 1=job or career related reasons; 0=general interest or various other responses not related to specific job or career objectives.

with those who made faculty choices based on general interest or aptitude (40%) (Table 19).

As expected, graduates from Arts and Science were much more likely to cite general interest rather than other reasons for selecting post-secondary educational programs while Business and Education students were split between 'job' and 'interest' reasons (Table 20). Engineering students were primarily motivated by subject interest in selecting their faculty, possibly because interests and aptitudes of students in Engineering are similar to those who choose to study Science.[24] Whatever the reason, this finding appears to counter the hypothesis that those who enter professional degree programs are necessarily more job or career oriented. Furthermore, less than 1% of these graduates specifically stated that they chose their degree for reasons of status or prestige. Finally, there were virtually no differences between males and females in reasons for faculty choice.

In summary, do motivation and attitudes toward work differ between the matched and mismatched groups? Not as far as attitude measures of achievement motivation and entitlement are concerned. However, there are indications that readiness for a long-term commitment to a job, as well as emphasis on job or career goals in selecting a degree

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[24] Engineering programs place a heavy emphasis on science and math courses.

TABLE 20

Faculty of Graduation and Sex by Reason for Choosing Faculty, 1987.

	Faculty					Sex	
	Arts	Bus.	Educ.	Eng.	Sci.	Female	Male
	%	%	%	%	%	%	%
Job *	10.3	50.7	50.4	28.4	19.4	[32.2	32.5
	(12)	(37)	(68)	(19)	(14)	(86)	(64)
Other	89.7	49.3	49.6	71.6	80.6	[67.8	67.5
	(105)	(36)	(67)	(48)	(58)	(181)	(133)
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Differences between faculties are statistically significant (p<.01. Chi-square test) but there are virtually no differences between females and males in reasons for choosing a faculty.

program may be associated with education-job match. Yet these factors are not necessarily related to choosing a degree program that is more career-specific. Though some of these indicators of attitude are clearly not associated with match outcomes, others may have a stronger influence if included in a multivariate model.

Summary of Bivariate Analysis

To this point, a fairly clear picture has begun to emerge about why some graduates became underemployed while others did not. The most significant factor influencing match status is faculty of study. If a student chose Science or Arts, she or he was less likely to be employed in a job requiring a degree two years after graduation. Business graduates were no more likely to be mismatched than the average graduate from any faculty, while Engineering and Education graduates were almost certain to be matched.

The industrial sector where graduates worked also had a significant effect on mismatch. There is a strong connection between matching and getting a specialized degree leading to employment in a specific industrial sector (e.g., Education graduates, with the highest rate of match, were almost exclusively employed in Education, Health and Welfare Services). However, despite the fact that working in the consumer services sector almost guarantees mismatch, a considerable proportion of graduates employed in other service sectors, including business services, goods producing and public administration, were also mismatched.

Socio-economic background and general labour market conditions explained little of the variation in match outcomes among this group of graduates. Being a few years older and presumably more mature also made little difference. Nor did working part-time in the final year of completing a university degree program.

Female graduates were no more likely to become underemployed than their male counterparts, since many chose Education as a field of study where match rates were high. Yet even within the faculties of Arts (where females outnumber males) and Science where graduates were prone to underemployment, women did not appear to be disadvantaged compared to men. Finally, match outcomes had relatively little to do with stated attitudes toward achievement or feelings of entitlement.

Generally, these graduates were strongly committed to the work force, and believed in the achievement ethic. They were less inclined to think they were entitled to a good job compared to their high school graduate contemporaries. Nevertheless, those who made a faculty selection for job or career reasons, and were more willing to make a long-term commitment to a job, were somewhat less likely to be mismatched.

Given these findings, the next step was to examine the effect of some of the above variables while controlling for others known or presumed to influence the education-job match.

Multivariate Logit Analysis

Further exploration of factors influencing matching 3 required logit or probit analysis since the dependent variable involved is dichotomous rather than continuous. For the purpose of this study, a graduate is either matched or mismatched.

The SPSSX program used allows for independent variables to be either dichotomous or continuous. Regression coefficients in a logit model are not interpreted in the same way as standard regression coefficients since there cannot be a linear relationship between the independent variables and the dependent variable. However, the ratio of coefficient to standard error (like a T-test in ordinary least squares regression), is used to determine the significance of the direct effect of each independent variable on the dependent variable while holding other variables in the model constant (Aldrich and Nelson, 1984). A value of 2 for this ratio is equivalent to a .05 level of significance (Walsh, 1987; Sampson and Wooldredge, 1987). Logit regression analyses also include a goodness-of-fit chi square statistic. Unlike ordinary regression analysis, where one seeks statistically significance results. Goodness-of-fit chi square will ideally be non-significant since this would signify that the expected distribution of cases using the logit model is not significantly different from the actual distribution of cases (Walsh, 1987).

Using the regression coefficients and standard errors, the probability of match for different groups of graduates can be calculated and compared. Thus, another advantage to using logit analysis is that it allows for results to be stated in terms of a probability ratio that is easy to interpret.

Some conversion of independent variables was necessary to set up the logit model for this analysis. Each faculty was identified with an independent binary dummy variable, with Education as the reference group, since Education graduates were most likely to be matched. Age, father's occupation, grade-point average, and labour market conditions were recoded as dichotomous variables in the same manner as in earlier analyses. The remaining variables, including the dependent variable (match=1, mismatch=0), were already in dichotomous form.

The attitude variables - readiness to make a long-term commitment to a job, feeling entitled to a job related to one's education, and agreement with always trying to improve your position in life - were converted to a 5-point scale with a mid-point of zero. In other words, a response indicating strong disagreement was changed to a value of -2 whereas strongly agree responses were coded +2. Those who were ambivalent or uncertain (an original score of 3) were given a value of 0.

Logit Results

Generally speaking, the logit model produced findings quite consistent with the bivariate analyses. As expected, Arts graduates were significantly less likely to be matched compared to Education graduates (a coefficient of 2.96) followed by those from the faculties of Science and Business (Table 21). There were no significant differences in match outcomes between Engineering and Education graduates. As indicated earlier, father's occupational status (managerial/professional versus other) had no significant effect, nor did age (being 25 and over). Working during the last year of university did not have a significant effect on being matched but graduates employed in part-time jobs two years after graduation were more likely to be mismatched. Working in a location where labour market conditions were favourable versus unfavourable had no significant effect when type of degree (faculty) was taken into account. Finally, controlling for all other factors, gender did not have a significant direct effect on whether or not a graduate was underemployed two years after leaving university.

TABLE 21

Logistic Regression Predicting Match by Respondent Characteristics, Attitudes, Employment Status, and Labour Market Conditions.

Independent Variable	Regression Coefficient	Coefficient./S.E.
Faculty of Graduation		
Reference Education=0		
Arts=1	-2.961	* -6.840
Science=1	-1.950	* -4.156
Business=1	-1.359	* -2.908
Engineering=1	-.787	-1.474
Sex	-.137	-.481
1=female		
0=male		
Father's Occupational Status	-.281	-1.117
Prof./Managerial=1		
Other=0		
Age	.272	.964
over 25 yrs.=1		
25 yrs. & under=0		
Grade-point average	.706	* 2.669
above average=1		
average and below=0		
Employment Status	1.688	* 3.326
Full-time=1		
Part-time=0		
Labour Market Conditions	.062	.220
Favourable=1		
Unfavourable=0		
Attitude		
Job Commitment	-.122	-1.204
Job Entitlement	-.066	-.673
Achievement Ethic	.137	1.223
Reason for Faculty Choice	-.015	-.548
Intercept	.317	14.125

Model Chi-square=405.384 df=384 p=.217

*Ratio of coefficient to standard error is greater than 2.

Contrary to conclusions drawn from the bivariate analysis, however, none of the self-reported attitude variables was significant. Being "Not ready to make a long-term job commitment" had a negative but non-significant effect on being matched that was larger than the effects of "entitlement" and "achievement motivation", but this variable was not significant. Reasons or motivation for choosing one's faculty of study also had no significant effect when type of degree acquired was controlled for statistically. Academic standing in the final year of one's program, however, emerged as an important factor in determining match outcomes. Those reporting higher grades were more likely to be in a job requiring a university degree.

Decisions to pare down the logit model were made on the basis of the theoretical relevance of variables, results from the bivariate analysis, plus the initial logit run including all 14 independent variables. For instance, although there was no indication to this point that gender made any difference in the probability of a graduate being matched, possible indirect effects with other variables had to be considered. Also, since both individual and structural levels of analysis are necessary to address various labour market perspectives on underemployment, labour market conditions and full- versus part-time employment status were included in a second logit model. Other variables included were ascribed characteristics such as age, socio-economic status (father's occupational status) and two of the attitude variables ("readiness to commit" and "achievement"). Grade-point average was retained, but the job entitlement indicator and working in the last 9 months of school were dropped since they were not significantly related to underemployment in the first analysis, and since they are not highly relevant theoretically. Faculty of study remains in the model.

Variables significant in the first model were also significant in the second logit analysis. But when the sample was split according to gender, in order to identify possible interaction effects, the second logit model did not converge likely due to an insufficient number of cases.[25] Thus, analysis of interaction effects was not pursued beyond this point.

The reduced logit regression model (see Table 22) confirms that, along with working in a full-time job, faculty choice is the most important factor in determining which university graduates will be matched. General attitudes toward work, then, have little bearing on match outcomes for university graduates in this sample. Those with above average marks, however, clearly had better match prospects.

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[25] A model does not converge when there are insufficient cases in the sample to consider all the parameters defined by the equation (Walsh, 1987:180).

TABLE 22

Reduced Logistic Regression Predicting Match by Respondent Characteristics, Attitudes, Employment Status, and Labour Market Conditions.

Independent Variable	Regression Coefficient	Coefficient/S.E.
Faculty of Graduation		
Reference Education=0		
Arts=1	-3.153	* -7.543
Science=1	-2.027	* -4.439
Business=1	-1.427	* -3.097
Engineering=1	-.868	-1.669
Sex	-.246	-.902
Female=1		
Male=0		
Father's Occupational Status	-.312	-1.117
Prof./Managerial=1		
Other=0		
Age	.301	1.082
over 25 years=1		
25 yrs. & under=0		
Grade-point average	.705	* 2.718
above average=1		
average and below=0		
Employment Status	1.611	* 3.228
Full-time=1		
Part-time=0		
Labour Market Conditions	.135	.493
Favourable=1		
Unfavourable=0		
Attitude		
Job Commitment	-.142	-1.438
Achievement Ethic	.110	1.000
Intercept	257	17.285

Model Chi-square=424.120 df=408 p=.281

*Ratio of coefficient to standard error is greater than 2.

As expected, socio-economic background, age and labour market conditions do not have a significant effect on match status once faculty differences have been taken into account. All other factors being equal, women were no less prone to mismatch than were men, controlling on other variables included in this model.

Finally, a third logit model including industrial sector location was analyzed since this variable also had a significant effect on matching in bivariate analysis. Table 23 shows that compared to the education, health and welfare service sector (the teachers) all other industrial sectors had a significant negative effect on matching. Full-time employment and having above average marks remained significant. However the effects of all faculties, except Arts, were non-significant compared to Education. This model reflects the strong correlation between faculty of graduation and the industrial sectors where these graduates were employed. Arts graduates were more widely disbursed across various industries so sectorial location would have less of an impact on matching for these graduates.

In short, the third logit model does not fundamentally alter the findings to this point, particulary since the main focus of this study is on match outcomes for graduates from different faculties. It does, however, demonstrate how the inclusion of structural variables adds another dimension to the analysis of inequalities in labour market outcomes.

TABLE 23

Reduced Logistic Regression Predicting Match by Respondent Characteristics, Attitudes, Employment Status, Labour Market Conditions and Industrial Sector Location.

Independent Variable	Regression Coefficient	Coefficient/S.E.
FACULTY OF GRADUATION		
Reference Education=0		
Arts=1	-1.895	* -3.534
Science=1	-.896	-1.552
Business=1	.006	.009
Engineering=1	.647	.969
SEX	-.031	-1.040
Female=1		
Male=0		
FATHER'S OCCUPATIONAL STATUS	-.271	-1.010
Prof./Managerial=1		
Other=0		
GRADE-POINT AVERAGE	.760	* 2.713
above average=1		
average and below=0		
EMPLOYMENT STATUS	1.178	* 2.171
Full-time=1		
Part-time=0		
LABOUR MARKET CONDITIONS	.065	.223
Favourable=1		
Unfavourable=0		
ATTITUDE		
Job Commitment	-.096	-.882
INDUSTRIAL SECTOR		
Goods	-1.828	* -3.738
Consumer	-3.986	* -5.986
Business	-1.286	* -2.529
Public Admin.	-1.486	* -2.813
INTERCEPT	1.340	18.022

Model Chi-square=428.886 df=408 p=.229

*Ratio of coefficient to standard error is greater than 2.

Log-Odds Ratio

Interpretation of the log-odds ratio puts a different interpretive light on these data but, again, it does not greatly enhance the findings which emerged from bivariate analyses. Converting the logit data output into probability statements involves a series of time-consuming calculations. The benefit of going through such a process is that results of logit analysis can be presented in a comparative form that is easily understood if not easily derived.

Using the logit data output from Table 21, Figure 4 explains how log-odds ratios are calculated from the regression coefficients.

Figure 4. Example of Conversion of Logistic Regression Coefficients into Probability Statements.

1. Add the value of the regression coefficients (including the y-intercept) of the variables you wish to compare.

2. Take the sum of regression coefficients and calculate the natural logarithm of this number.

3. The log odds ratio equals the natural log (calculated as above) divided by a denominator of 1 + the natural log. For example:

   Log odds ratio for Arts = .980 / 1+ .980 = .495

4. To calculate the probability of match for a graduate of Arts versus Business, divide the log odds ratio for Business by the log odds ratio for Arts. For example:

   .857/ .495 = 1.7

Source: Walsh, A. (1987).

Considering respondents who have everything going for them - those 25 years of age or older, whose fathers were managers or professionals, who worked full-time in favourable labour markets, expressed a high job degree of work commitment and had a strong drive to achieve - log-odds ratios indicate graduates from Engineering were 2 times more likely to be matched than graduates from Arts. Those with Business degrees were 1.6 times (females) or 1.7 times (males) as likely to achieve match status relative to Arts graduates while male Science graduates had 1.5 log-odds ratio over male with an Arts degree. Women Science graduates were 1.3 times as likely to be matched as women with an Arts degrees.

Since academic performance was a significant factor in matching, it is worth examining intra-faculty log-odds ratios between those with above average marks and those with marks below the average. The effect of marks on matching is negligible among graduates in Business and Engineering. However there were differences among Arts and Science graduates. Controlling for the same characteristics as above, female Arts graduates with above average marks were 1.6 times as likely to be matched as those with below average marks while graduates with equivalent standings in Science had a 1.4 greater chance of being matched compared to those with lower averages.

Whereas bivariate analysis suggested academic performance made no significant difference to match outcomes for Arts graduates, a direct effect is apparent in multivariate analysis. Why academic performance is connected with match status for Arts and Science graduates but not for Business and Engineering graduates is a matter for further study. Perhaps it has something to do with the nature of recruitment in different labour markets, or is related to a tendency towards higher marks in certain subject areas where matching may be more likely to occur (e.g., social work versus history or English; computing science as opposed to chemistry or physics).

Whatever the reason, it is evident that the effect of marks on matching depends on the faculty of graduation. Thus, comparison of log-odds ratios on significant variables in the logit model provides a clearer picture of the extent to which some graduates are disadvantaged due to the type of degree acquired.

Summary of Multivariate Analysis

Logit analysis confirms the overriding influence of faculty selection on match status, but also reveals that the link between these two variables is not as simple as it seems on surface. Socio-economic status and age clearly do not affect match probabilities once faculty selection has occurred. Gender has no direct effect on matching although occupational and, hence, faculty choices for women and men are distinctly different. Attitudes toward work have little impact on matching, while academic achievement emerges as a more important determinant of match status.

Unfulfilled Expectations and Perceptions of Underemployment

Before concluding the analysis of determinants of mismatch, it is instructive to test the hypothesis that perceptions of underemployment arise primarily from unfulfilled expectations (Burris, V. 1983). Were these 1985 graduates expecting to find a job requiring a degree at the time they entered the labour market? This survey contains one question that sheds some light on this issue. Respondents were asked in May 1985, just as they entered the labour market after graduation, what type of job they eventually expected to have? By coding these jobs the same way present jobs were designated as a match or a mismatch, graduates' expectations could be compared with actual labour market outcomes in 1987.

For the total sample used in this study, 23% of graduates expected to be matched and were not, while the majority (77%) predicted match status accurately (Table 24). But 37% of those who thought they would never enter a matched job had a job requiring a degree two years after graduation. Hence, there were relatively more underestimations than overestimations of match.

TABLE 24

Match Status, 1987 by Job Expectations Prior to Graduation

	Expected mismatch	Expected match
	%	%
Actually Mismatched	* 63.4 (78)	22.6 (70)
Actually Matched	36.6 (45)	77.4 (240)
Total	100.0 (123)	100.0 (310)

*Differences between 'expected mismatch' and 'expected match' groups are statistically significant (p<.01, Chi-square test).

Examination of differences in expectations within faculties identifies the source of overestimation (Table 25). Almost two thirds of the Arts students who expected to be matched were mismatched two years later, while less than half (43%) who expected to get matched jobs actually did. More than a third of the Science graduates who thought they would eventually enter jobs requiring a degree were mismatched, while only 16% of the Business graduates had unfulfilled expectations of match.

It is interesting to note that Engineering graduates were far more pessimistic about their prospects for becoming matched. In May 1985, 37% of respondents from the faculty of Engineering were not expecting to be matched whereas by 1987, only 18% were in jobs not requiring a degree. This is probably a reflection of the drop in demand for engineers beginning with the 1981-82 recession. By 1987, however, the market for engineers had improved considerably.

Theoretically, the key question is whether or not there was a significant relationship between the two subjective measures of mismatch ("My job lets me use my skills and abilities" and "My job is directly related to education and training") and graduates with unfulfilled expectations of matching (Table 26). Indeed, those who predicted they would eventually be matched but were not, two years later, were much more inclined to perceive themselves as underemployed compared to those who did not overestimate match.

TABLE 25

Match Status, 1987 by Match Expectations, 1985 by Faculty

	Expected to be matched and were mismatched:	Expected to be matched and were matched:
	%	%
ARTS	*57.1	42.9
BUSINESS	15.6	84.4
EDUCATION	8.9	91.1
ENGINEERING	7.7	92.3
SCIENCE	36.2	63.8

*Differences between groups are statistically significant (p<.05, Chi-square test).

TABLE 26

Subjective Mismatch by Unfulfilled Match Expectations

	Others	Expected to be Matched but were Mismatched (Unfulfilled expectations)	
	%	%	
1) "Job lets me use my skills and abilities."			
Disagree	* 32.0 (124)	55.1 (38)	
Agree	68.0 (263)	44.9 (31)	
	100.0	100.0	N (456)
2) "Job is directly directly related to my education and training."			
Disagree	* 33.2 (129)	73.9 (51)	
Agree	68.8 (259)	26.1 (69)	
	100.0	100.0	N (457)

*Differences between those with 'unfulfilled expectations' versus 'others' are statistically significant ($p<.01$, Chi-square test).

Unfulfilled expectations, then, may be partially responsible for graduates' perceptions of underemployment (Burris, 1983:464), although this by no means accounts for the proportion of graduates who think they are not utilizing their skills or are in jobs unrelated to their education and training. Furthermore, graduates were reporting their eventual job expectations, not where they expected to be two years after graduation. Though graduates with Education, Engineering and Business had fewer unfulfilled expectations, than those from Arts and Science, it is possible that students with less occupationally specific degrees expected to take a longer time to work their way into matched jobs. Whatever the interpretation of unfulfilled expectations might be, it should not be considered a major cause of mismatched underemployment.

Presumably, some of the matched graduates also expected more from their jobs, since many reported low skills utilization and said their education was unrelated to their job. There is a need, then, to look closely at these and other important qualitative differences in job outcomes for graduates to determine if there are distinct advantages to getting a job that requires a degree. Thus, the next chapter looks at the effects of mismatch on the quality of employment for these 1985 university graduates.

CHAPTER VII. THE CONSEQUENCES OF MISMATCHED UNDEREMPLOYMENT

Job Outcomes for Matched and Mismatched Graduates

Marginal Employment

As discussed in Chapter III, conceptually, it is important to distinguish occurrences of other forms of marginal employment (part-time work, intermittent employment) and unemployment from mismatch underemployment. In the sample for this study, 92.1% of respondents were working in full-time jobs two years after leaving university. Those in a mismatched position were more likely to be working part-time (Table 27). Although a larger percentage of female graduates were employed part-time, gender differences were not statistically significant. Because only 7.9% of respondents in this sample were part-time employees, they are included with full-time workers in subsequent analyses.

In May 1986, the mismatched group reported an average of five and one-half weeks of unemployment during the past year, compared to three and one-half weeks for the matched group (Table 28). Number of weeks unemployed between 1986-87 declined to just under 3 weeks for the mismatched and one and a half weeks for the matched. Mismatched graduates reported an average of two and a half months part-time work in 1986 compared to one and a half months for the matched.

TABLE 27

Full-time and Part-time Employment by Match Status, 1987

	Mismatched	Matched	Total
	%	%	%
Full-time	* 86.8	94.2	91.9
	(125)	(294)	(419)
Part-time	12.5	5.8	7.9
	(18)	(18)	(36)
No job	.7	-	.2
	(1)		(1)
Total	100.0	100.0	100.0
N	(144)	(312)	(456)

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*Differences between mismatched and matched groups are statistically significant (<.05, Chi-square test).

TABLE 28

Marginal Employment by Match Status, 1987

	1985-86		1986-87	
	Mismatched/	Matched	Mismatched/	Matched
Average number of **weeks unemployed**	* 5.5	3.5	* 2.8	1.4
Average number of **months part-time** employment	* 2.4	1.5	* 1.9	.9
Average **number** of different**jobs**	* 2.2	1.8	3.3	3.0

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*Differences between mismatched and matched groups are statistically significant (one-way analysis of variance,p<.05).

In 1987 reported length of time in part-time work dropped to two months for the mismatched and one month for the matched.

Differences in intermittent employment indicated by number of jobs held for both groups, were significant but negligible in 1986; while in the following year, mismatched graduates held just as many jobs (an average of 3) as their matched peer group (Table 28). A considerable amount of job changing went on for both matched and mismatched graduates. Mismatched graduates were however, significantly more inclined to leave their jobs because they were dissatisfied (38%), compared to matched graduates (18%); while matched graduates were somewhat more likely to change jobs for something better (38% vs. 33%).

Thus graduates who were mismatched in 1987 were also more likely to experience longer periods of unemployment or low-hours underemployment (part-time work). The differences between matched and mismatched graduates are statistically significant but in terms of absolute values, the differences are not that great. Hence, mismatched graduates may be more prone to other types of underemployment but the problem of education-job match is, for the most part, a distinctly different form of marginal employment.

Industrial and Occupational Segmentation

Sectorial analysis by industrial categories adds another dimension to analysis of employment outcomes. Using the industrial sector categories developed by Myles et al. (1988:131) helps locate the sources of 'good' and 'bad' jobs for this particular group of university graduates (Table 29). Education, health and welfare services provided 47% of the matched jobs followed by goods producing or resource industries (22%), and business services (16%). Mismatched jobs were distributed across all industrial sectors with the largest proportion (27%) located in consumer services industries (retail, food, accommodation, entertainment and personal services). Business services (21%), the goods producing sector (18%), and public administration (14%) also provided a fair share of underemployment while education, health, and welfare or distribution services hired fewer graduates into jobs not requiring a degree.

Table 4, discussed in Chapter VI, clearly shows that mismatched graduates entered different occupations than their matched counterparts. In 1987, nearly 60% of mismatched graduates were in clerical, sales and service occupations while the matched were working in professional jobs, primarily as teachers (43%) or engineers (31%). An equal proportion of both groups (18%) were found in the managerial occupational category. Small numbers of mismatched graduates were scattered among various occupations whereas the matched were almost exclusively employed in professional, administrative or managerial jobs.

TABLE 29

Industrial Sector by Match Status, 1987

	Mismatched %	Matched %
Goods Producing	* 17.7 (28)	22.1 (66)
Distribution	* 10.1 (16)	3.0 (9)
Consumer Services	* 26.6 (42)	2.3 (7)
Business Services	* 20.9 (33)	16.1 (48)
Education, Health and Welfare Services	* 10.8 (17)	47.0 (140)
Public Administration	* 13.9 (22)	9.4 (28)
Total	100.0	100.0
N	(158)	(298)

SOURCE: Industrial sector categories from Myles et. al., (1988).

*Differences between mismatched and matched groups are statistically significant (p<.01, Chi-square test).

Only 7% of the mismatched were working in blue-collar jobs in construction, manufacturing or transportation and communications. Thus, there were few labourers, assembly line workers, taxi or truck drivers. Rather, the underemployed in this sample were more likely to be in lower level white-collar jobs such as typists, receptionists, electronic data processors, tellers, cashiers or retail sales clerks. The proportion of underemployment accounted for by clerical jobs is virtually the same for this sample of graduates (9.4%) as it was for the 1982 National Survey of university graduates which estimated clerical employment to be around 10% (Clark et al., 1986:62).

For the most part, graduates in this occupational category were women. Occupational distributions for mismatched males and females pin-point high concentrations of women in clerical jobs (38.4%) whereas the underemployed males were more likely to be found in sales jobs (30.8%). While many of the sales jobs occupied by males were sales supervisors or sales representatives, the majority of female clerical jobs were lower level, non-supervisory positions.

Segmentation according to gender also occurs in the matched group where 63% of the females were in teaching and related occupations compared to 19% of the males. Occupations in the social sciences (social work, psychology, personnel or industrial relations) were also more common among female graduates. Males were concentrated in engineering (31%), accounting (18%) and were more prevalent in occupations related to the sciences, particularly geology and computing science.

Detailed Occupational Profiles by Faculty of Graduation

Since previous multivariate analyses have shown faculty choice is the most important factor influencing match outcomes, it is useful to examine occupational distributions according to faculty of graduation and match status. Are there distinctly identifiable markets for graduates from different faculties, or is there a considerable degree of occupational overlap? What kind of jobs do graduates from the more specialized degree programs enter compared to those who have a general degree in Arts or Science? Do males and females with the same kind and level of educational preparation end up in the same kind and level of occupations? The detailed occupational profile for graduates from different faculties provides a useful commentary on the role of credentials in signalling job suitability or matching (Table 30).

Perhaps the most salient observation is that matched graduates from all faculties entered occupations related to their degree program. With few exceptions, Education and Engineering graduates went into their respective professions while the majority of Business graduates were in financial management or accounting. Even Arts and Science graduates

TABLE 30

Occupational Frequency Distributions by Match Status and Faculty

	Mismatched	Matched
ARTS	n (77)	n (34)
	Clerical (33)	Social Worker (8)
	Sales (16)	Teacher (6)
		Finance and admin. managers (6)
	Non-professional managers/admin. (9)	Social science or humanities professionals (5) -includes an economist, psychologist, a rehabilitation counseller, a writer editor and a museum archives or library scientist.
	Blue collar (4)	
	Other (15) -includes artist (3) coach/trainer, police, corrections or community service (3); waiter (3); technician (2); etc.	
		Research Assistants (4)
		Others (5) includes planners (3).
BUSINESS	n (23)	n (49)
	Non-professional managers/admin. (10) (8 in sales and advertising)	Accountant (articling student) (35)
		Financial manager (4)
	Sales supervisors, sales representatives, real estate (7)	Systems analyst or programmer (4)
	Clerical (3)	Statistician (2)

	Other (4) -includes a production manager, a government official, or administrator, a construction foreman and a labourer)	Other (4) -includes a community planner, a personnel administrator, an education or vocation counsellor and a college teacher
EDUCATION	n (14)	n (121)
	Sales retail (4) Clerical (4) Other (6) -includes a non-professional manager, a welfare or community service worker, a corrections officer, a nurse therapist, a hair stylist and a taxi driver	Teacher (116) Other (5) -includes an accountant, an education/vocation counsellor, a graduate assistant, a naturopath and a nurse
SCIENCE	n (33)	n (40)
	Technician/ technologist (science, engineering or architecture) (11) Sales supervisor, representative or real estate (9) Clerical (5) Blue collar (5) Non-professional manager/admin. (4)	Natural science or engineering (16) includes: geologist (9); other scientists (5) (a chemist, a physicist, a meteorologist, a botanist/zoologist, and a forester); a manager, natural science; and a chemical engineer; Systems analyst/programmer (5) Manager/administrator finance, personnel or accounting (4)

		Other (4) (includes a social worker, a planner a nurse and a pharmacist)
ENGINEERING	n (11)	n (54)
	Non-professional	Professional Engineers (44)
	manager/admin. (6)	Systems Analyst (4)
	Other (5) includes sales reps. (2); police; labourer; assembler	Others (6) includes manager, engineering; military officer; etc.

tended to find employment related to their general area of study. Two years after graduation matched Science graduates were working as professional scientists or computer analysts/programmers. Similarly, two-thirds of the matched Arts graduates were working in professions related to social sciences or humanities.

Career paths for mismatched graduates are less distinct; however, there are noticeable patterns across the various faculties. Clerical and sales jobs account for most of the mismatched employment for graduates from all faculties followed by a small group in non-professional managerial or administrative jobs. These occupations include jobs such as construction manager, purchasing officer, account executives who sell advertising, a gas station manager, assistant department store managers, an assistant hotel manager, a dining room manager, a production manager in an assembly plant, and an office manager for a law firm. This category also refers to jobs in public administration, information or public relations such as an administrative co-ordinator for a Canada Employment Office, a self-employed public relations manager, a secretary-administrator, a business improvement co-ordinator, and a fund-raising co-ordinator.

Mismatched female Arts graduates, as noted above, were most likely to be employed in clerical jobs ranging from office or accounts supervisors to typists, receptionists, cashiers and tellers while mismatched science graduates ended up working as technologists or technicians. Both Arts and Science graduates held sales jobs but Science graduates worked as supervisors or sales representatives whereas several Arts graduates were retail sales clerks.

Mismatched Business graduates were primarily found in sales related occupations (accounts executive, marketing jobs and sales supervisors or representatives) with a small group in non-professional managerial or administrative jobs, and a few clerical workers in accounting and electronic data processing. None of the mismatched Engineering graduates (all males) were working in clerical or retail sales jobs whereas more than one half of the small group of mismatched Education graduates were found in these occupations.

It is interesting to observe where credential boundaries are crossed. For example, management and administrative positions associated with staff functions such as accounting and finance, personnel or industrial relations, advertising, marketing purchasing, public relations and general administration were occupied by graduates in Business, Arts and Science. Almost one third of the matched Arts graduates competed successfully with Business and Science graduates for jobs as financial or personnel managers or administrators, accountants, and planners.

While the majority of systems analysis or computer programming positions were filled by Science graduates, students from Business, Engineering and Arts were also hired for these jobs. A small group of community planners consisted of graduates from Business, Arts, and Science.

The implications to be drawn from these observations are limited by the fact that employers' perspectives on job requirements and hiring practices were not investigated. However, it would be fair to question the tendency toward greater specialization and professionalization of post-secondary education programs when graduates from various faculties are capable of performing the same functions. For instance unless a Business graduate goes on to article as a Chartered Accountant, he or she is likely to end up in a job similar to an Arts or Science graduate. Opening up boundaries between Arts, Science and Business would encourage graduates to acquire a broader range of knowledge and skills, perhaps increasing their opportunities for a better job match.

Further implications might be drawn from the fact that a significant proportion of Science graduates were either working at a technical level where their knowledge and training were underutilized, or not applying their knowledge at all in an occupational capacity.[26] These graduates include those who studied computing science, mathematics, geology, biology, chemistry, zoology, physics and meteorology. In a society calling for development of greater scientific and technological expertise, it seems incongruous to have so many science graduates underemployed.

In general, however, there were clear linkages between the type of educational preparation selected, the type of work a graduate ended up doing, and whether or not they were matched. Just two years after graduation, distinct career paths are clearly identifiable and occupational outcomes fairly predictable. But what were the consequences of being a mismatched graduate? Some who were matched in 1987 had started off in mismatched jobs (25%). In fact 17 of these graduates who were in clerical jobs in 1986 went on to become accountants, teachers, a personnel administrator, a systems analyst, an economist, a statistician, an engineer and a rehabilitation counsellor. Hence, there is reason to believe that further transitions from mismatched to match status will occur in the future. There is also the danger however, that working in a lower level job for a longer period of time may inhibit career advancement. For example, Blossfeld's (1987) study of gender differences in labour market outcomes for various different cohorts, indicates women are less likely to be promoted or hired for trainee positions compared to young men. Their tendency to take skilled clerical, administrative and technical support positions also negatively affects their chances of advancement into professional and managerial jobs (106-107).

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[26] Some employers, such as universities, may require degrees for technician or technologist positions, but these graduates were underemployed according to the general educational development scores for the positions they occupied.

For the time being, however, it is important to know how mismatched graduates were affected by working in jobs that did not require the level of educational qualifications they possessed. Were they making less money or are they any less satisfied with their jobs than the matched graduates?

The Consequences of Mismatch of Graduates' Earnings

Bivariate Analysis of the Effects of Match Status on Earnings

Although the issue of economic returns to investments in college education has been examined in the literature on underemployment (Freeman, 1975; Smith, 1986) the relationship between mismatched employment status and earnings has not been fully investigated.

The average take-home pay for graduates included in this study is $380.00 per week, with 22% earning gross salaries of $20,000 a year or less. At the other end of the wage scale, 15% of these graduates were bringing home more than $500.00 per week, an estimated gross annual salary of $32,800 or higher.[27]

As presented in Table 31, the average take-home pay was highest for graduates working in the goods producing industrial sector of the labour market ($458.00 per week), while those in the consumer services sector earned substantially less ($269.00 per week). Graduates employed in education, health and welfare services, the majority of whom were teachers, earned less than those who entered occupations in the distribution, public administration or business services sectors. At $345.00 per week, however, their take-home pay generously exceeded those who found jobs in consumer and personal services.

Overall, matched graduates earned an average of $50.00 more per week than mismatched graduates. Yet for graduates from the faculties of Arts and Business, being underemployed made little difference. In general, Engineering graduates fared better than graduates from all other faculties, earning an average take-home pay of $472.00 per week. Surprisingly, Business and Science graduates were not far apart averaging $381.00 and $394.00 per week, while Education and Arts graduates took home around $340.00 per week. Thus, even though Science graduates were the second

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[27] Gross annual salaries were crudely estimated by adding 30% (approximate deductions for income tax, Canada Pension, U.I.C. etc.,) to annual net take-home pay.

TABLE 31

Income by Industrial Sector, 1987

Sector	Average take-home pay per week
Goods Producing	* 458.38
Distribution	412.46
Consumer Services	269.33
Business Services	369.40
Education, Health and Welfare Services	345.05
Public Administration	398.29
All Industries	374.51

SOURCE: Industrial categories from Myles et al., (1988)

*Differences between sectors are statistically significant ($p<.01$, F-test, One-way analysis of variance).

most likely to be mismatched, they earned more than those with Arts, Business and Education degrees (Table 32).

Earnings variances for Business and Education graduates require further explanation. For example, the majority of the matched group from Business were articling Chartered Accountant students who were likely to be making relatively low wages. This may explain why the mismatched business graduates seemed to fare better than those working in jobs compatible with their level of education. As for the very large gap between matched and mismatched Education graduates, further analysis indicates most of the mismatched were working part-time. Conceivably, these graduates may have accepted part-time work in lower level jobs as they waited to be hired for full-time teaching contracts.

In this group of graduates as a whole, the women earned an average of $76.00 less per week than the men, a difference which was statistically significant. Interesting pay differentials arose when matched and mismatched males and females with the same credentials were compared (refer also to Table 32). Females, from all faculties except Education, earned less than the males regardless of whether they were matched or not. Gender differences within faculties were significant for Arts graduates only.

Mismatched females with general degrees were at a distinct disadvantage compared to mismatched males with the same qualifications earning on average $90.00 (Arts) and

TABLE 32

Three-way Analysis of Variance - Earnings by Match Status, Sex and Faculty, 1987*

	Average take-home pay per week ($)		
	Mismatched	Matched	Total
All graduates	340.77	391.38	374.51
Female	306.07	362.09	342.23
Male	394.95	427.88	417.84
ARTS	336.65	341.84	338.25
Female	312.30	329.05	317.28
	+{		
Male	399.95	370.00	389.97
BUSINESS	383.71	379.43	380.71
Female	358.73	364.84	362.60
Male	411.20	388.67	394.30
EDUCATION	236.36	357.08	344.47
Female	232.62	357.68	343.29
Male	285.00	354.10	350.81
ENGINEERING	408.50	484.54	472.27
Female	---	480.71	480.71
Male	408.50	485.13	471.20
SCIENCE	346.93	428.36	393.63
Female	310.00	382.50	347.59
Male	376.93	454.04	423.95

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*Main effects of match status, sex, and faculty of graduation are statistically significant (p<.01, F-test) as are two-way interaction effects of match status and faculty (p<.05, F-test).

+Differences between mismatched female and male arts graduates are statistically significant (p<.05, One-way analysis of variance).

$66.00 (Science) less per week. However, gender differences were statistically non-significant for Science graduates as well as Engineering, Education, and Business graduates. Whereas previous analysis of the Study of Transitions from School to Work data shows that female graduates earned less than males regardless of the kind of degree they have acquired, these findings provide only partial evidence of such a gender gap (Hughes, 1988:156). Further multivariate analysis will examine the effects of gender, faculty and match on earnings more closely.

Regression Analysis of the Effects of Match Status on Earnings

In regressing the effects of match on earnings, it was necessary to control not only for gender and faculty but to include other important variables such as length of time on the job, full-time or part-time employment, and labour market conditions (coded again as favourable and unfavourable according to local unemployment rates). Binary variables were set up to indicate faculty of graduation with Engineering designated as the reference group since these graduates reported the highest average income and also had a high rate of match.

Length of time in present job was categorized into groups of less than 1 year, from 1-2 years, and over 2 years. Of course in 1987 almost all of these 1985 graduates had held their jobs for 2 years or less, while the few who reported being on the job for more than 2 years had presumably combined work and education at some point during the course of their degree program.

Regression Results

The first regression run (Equation B, Table 33), included all of the above variables. Results indicated neither labour market conditions nor match status had a significant effect on earnings. When part-time/full-time status was excluded from the equation, however, matching did have a significant effect on earnings for these graduates (Equation A, Table 33)[28]

Taking the other independent variable into account, the unstandardized regression coefficients (B) revealed earnings for mismatched graduates were lower than earnings for matched graduates by $40.00 per week. Controlling on match status, female graduates brought home $39.00 less per week. Compared to Engineering graduates, those with Science degrees took home on average $51.00 less per week, followed by graduates from Business, whose earnings were $73.00 per week lower, Arts graduates who trailed by $82.00 per week, and teachers who netted $93.00 less per week than the engineers.

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[28] Earlier analysis shows graduates employed part-time were more likely to be mismatched. Since these two independent variables are highly correlated, and because match status is the key theoretical variable only the latter was included.

Equation C, Table 33 presents regression coefficients for a model including industrial sector location. Adding this variable to the regression model increases the variance in earnings explained and reduces the effects of faculty. When industry differences are taken into account, the earnings gap between Education or Science graduates and Engineering graduates (the reference group) was no longer statistically significant. Arts and Business graduates, however, earned an average of $44.00 less per week compared to Engineering graduates. Since the goods producing sector is the reference group, this model also indicates the extent to which earnings are affected by employment in different sectors of the service economy. Graduates who worked in the consumer services industry earned an average of $126.00 less per week than graduates who worked in the goods producing sector. Graduates employed in education, health and welfare services did relatively better, earning $80.00 less per week, while the average take home pay for those in the business services sector was $49.00 less per week.

Equation B demonstrates that the effect of matching on earnings is relatively weak compared to the effects of full-time employment. Nevertheless, the effect of match status is statistically significant, in both models excluding the variable employment status. This is to be expected since bivariate analysis indicated those who were part-time workers were more likely to be mismatched.

TABLE 33

Regression Results Predicting the Effects of Match Status, Length of Time in Job, Local Labour Market Conditions, Industrial Sector, Sex and Faculty on Average Take-home Pay Per Week, 1987

	Equation A		Equation B		Equation C	
	B	Beta	B	Beta	B	Beta
MATCH STATUS	*39.63	.140	22.28	.078	*32.18	.113
1=matched						
0=mismatched						
EMPLOYMENT STATUS			*177.58	.351		
1=full-time						
0=part-time						
LENGTH OF TIME IN JOB	*26.41	.137	* 22.21	.115	*22.23	.114
2=over 2 years						
1=1-2 years						
0=less than 1 year						
LOCAL LABOUR MARKET CONDITIONS	-4.74	.017	-5.35	-.020	-1.45	-.004
1=favourable						
0=unfavourable						
SEX	*-39.08	-.144	*-40.05	-.148	*-34.70	-.128
1=female						
0=male						
FACULTY						
Reference Engineering=0						
Arts=1	*-81.89	-.260	*-79.43	-.251	*-43.52	-.138
Business=1	*-72.71	-.200	*-80.56	-.221	*-44.19	-.121
Education=1	*-93.13	-.320	*-74.47	-.256	-29.57	-.102
Science=1	*-50.92	-.138	*-53.76	-.146	-24.36	-.066
INDUSTRIAL LOCATION						
Reference Goods=0						
Ed.Health=1					*-79.07	-.281
Business=1					*-48.77	-.140
Pub. Admin.=1					-24.98	-.058
Consumer=1					*-125.63	-.286
CONSTANT	420.05		266.94		438.96	
N=434	Adj. R^2=.154		Adj. R^2=.269		Adj. R^2=.208	

Engineering was chosen as the faculty reference group since these graduates had the highest average earnings compared to graduates from other faculties.

B is the unstandardized regression coefficient.
*p<.05

Though the regression coefficients for faculty of graduation and industrial sector must be interpreted in relation to the reference groups, the size of the standardized regression coefficient suggests these variables are key predictors of graduates' earnings.[29]

In sum, these regression results (which control on additional variables) confirm results obtained from the analysis of variance on earnings by faculty, match status and gender (Table 32). Interpretation of unstandardized coefficients in the regression model, however, specifies actual sizes of earnings differentials by faculty, gender, match status and industrial sector location. The dummy variables for faculty and industrial sector also indicate the relative marketability of one type of degree over another and demonstrate how graduate earnings were significantly less in the service sector compared to the goods producing sector.

Were most graduates earning what they expected, given the type of degree they chose to obtain? Though graduates would tend to compare their earnings with those working in the same profession or occupation, such a discrepancy in earnings among people with the same level of education might be perceived as somewhat unfair.

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[29] There are additional difficulties in interpreting standardized and unstandardized regression coefficients for dummy variables because standard deviations are meaningless (Fox, 1984:85). However the size of the regression coefficient does indicate the relative weight of a dummy variable in a regression model.

Perception of Earnings Relative to Education

In 1987, the survey respondents were asked to evaluate their earnings given their education, training and experience (Table 34). Since there was little variance in training and experience among members of this sub-sample, respondents would be expected to use education as the most important criteria in evaluating their earnings.

Slightly less than half (48%) of these graduates thought they were earning less than they deserved, while the other half (51%) agreed their incomes were on par with their qualifications (Table 34). Only a handful said they earned more than they deserved. The fact that almost half of the graduates in this sample thought they were not earning what they deserved, suggests graduates in entry level jobs may have somewhat inflated expectations of pay to begin with. However, the more important theoretical question for this study is were their differences in the way matched and mismatched graduates perceived their earnings?

Mismatched graduates differed significantly from the matched group as approximately 60% of the former thought they were earning less than they deserved compared to 42% of the matched. It should be noted that females reported earnings below what they felt they were worth to a greater

TABLE 34

Perceptions of Earnings by Match Status and Faculty of Graduation, 1987

	Mismatched	Matched	All
	%	%	%
Given your education, training and experience, do you feel that you are now earning.......			
About the right amount or more than you deserve	* 40.8	57.9	52.0
	(64)	(172)	(236)
Less than you deserve	59.2	42.1	48.0
	(93)	(125)	(218)
Total	100.0	100.0	100.0
N	(157)	(297)	(454)

	Arts	Bus.	Educ.	Eng.	Sci.	All
About the right amount or more than you deserve	* 40.9	43.1	58.5	63.1	56.2	52.1
	(45)	(31)	(79)	(41)	(41)	(237)
Less than you deserve	59.1	56.9	41.5	36.9	43.8	47.9
	(65)	(41)	(56)	(24)	(32)	(218)
Total	100.0	100.0	100.0	100.0	100.0	100.0

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*Differences between mismatched and matched groups as well as differences between faculties are statistically significant (p<.05, Chi-square test).

extent than males, although gender differences were not significant.

Rankings according to faculty are interesting (Table 34). Next to Arts graduates, close to 60% of whom thought they earned less than they deserved, most of the graduates in Business felt they were worth more, possibly due to the large numbers of Chartered Accountant articling students in this group. The majority of Science Engineering, and Education graduates thought they were earning what they deserved. No doubt earning expectations prior to graduation influenced post-graduate evaluations of earnings. But the fact that matched graduates whether they earned relatively high or low salaries compared to graduates from other faculties, were more likely to perceive themselves as earning what they deserved suggests that being matched leads to greater satisfaction with income. In the case of teachers, being matched may compensate for their relatively low earnings compared to graduates with the same level of educational attainment.

Summary of Income Consequences

For the 1985 graduates in this study, being mismatched generally meant earning less than a graduate in a job requiring a degree. Although gender differences among graduates from the specialized, professional faculties (Education, Engineering and Business) were small, especially for the matched, women in Arts and Science earned much less than their male counterparts.[30]

The impact of matching and gender on income, however, depended on the kind of degree acquired. For instance, being mismatched in Education was extremely detrimental to the earning power of these graduates; whereas match status had no impact on earnings for Business graduates. On the other hand, being a mismatched Arts female was a greater handicap than being male and mismatched with the same degree. Generally, in occupations where entry is less defined by credentials, females earned less than males.

Finally, though Education graduates were at the bottom of the earnings hierarchy, the majority said they were earning what they deserved, while the majority of Arts and Business graduates thought they deserved to earn more. Seemingly, Arts and Business graduates expected their degrees to [illegible]mand a higher dollar value and were perhaps less informed about probable labour market outcomes. In this way expectations continue to influence subjective perceptions of underemployment after mismatch occurs.

These results indicate the variance in earnings among graduates with different kinds of bachelor's degrees. Choosing a professional or occupationally-oriented faculty, with a higher rate of match, does not necessarily mean a graduate will earn more money than someone who graduates from general Arts or Science. The industry where graduates are employed, and whether they get a full or part-time job has a greater effect on earnings.

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[30] As noted earlier, however, gender differences for earnings among science graduates were not significant.

More importantly, the labour market for graduates is conspicuously segmented according to gender based differences in occupational aspirations and outcomes. Though gender has no direct effect on match status, it does have a significant effect on pay. However, these data imply women may be sheltered from discriminatory pay practices if they choose degrees leading to occupations which rely more on formal credentials for entry (i.e., Education and Engineering).

Clearly subjective measures of underemployment, in this case related to earnings, are important to understanding how graduates assess the education-job match. Examination of the relationship between match status, job satisfaction and graduates' evaluations of various other aspects of their jobs can add a further dimension to the psychological perspective on this problem.

The Consequences of Mismatch on Job Satisfaction and Quality of Employment

The Effects of Match Status on Overall Job Satisfaction (Bivariate Analysis)

Two general measures of job satisfaction were used in this study. The first question, "How satisfied are you with your job?" is the most commonly used measure to gage overall job satisfaction. The second question, "If you had the choice to make again, would you choose the same type of work you now do?" is a measure of behaviour intention which serves to verify general job satisfaction responses. As Krahn and Lowe (1988:160-161) discuss, survey respondents typically report high levels of job satisfaction (around 80-89%) according to the general measure; while, behavioural intention questions, such as the one above, usually reveal somewhat lower levels of job satisfaction (around 60%).

Using the general measure of job satisfaction, matched graduates in this study were unmistakably more satisfied with their jobs compared to mismatched graduates (Table 33). The majority of the matched (69%) said they were satisfied with their jobs whereas only 44% of matched graduates expressed satisfaction. In fact, the mismatched graduates in this sample were even less satisfied (44% versus 52%) than the high school included in the larger Transitions from School to Work Study.[31]

Job satisfaction levels for both matched and mismatched graduates are considerably lower than those typically reported in surveys of the general population. This is not simply due to the fact that this is a relatively young segment of the population. Analysis of the Edmonton high school and university data (Krahn and Lowe, 1990) found that overall job satisfaction of university graduates was only slightly higher that for high school graduates (63 versus 58%) and somewhat lower than expected compared to other surveys of Canadian university graduates (74). Krahn and Lowe (1990) speculate this may have something to do with the fact that many graduates have not yet achieved the jobs they aspire to.

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[31] This difference has not been tested for statistical significance, since the high school data was not included in the systems file for this study.

This argument is entirely plausible according to the results in this study. The percentage of both matched (82%) and mismatched (61%) graduates who say they would make the same choice again about the type of work they are doing (Table 36) is actually higher than the level of job satisfaction expressed through the general measure (Table 35). Thus, graduates do not necessarily regret the career course they have taken, but may be dissatisfied with the point they are at in their career progression. Other measures would be required to determine if the mismatched were simply content with their employment outcomes or felt they had no choice in what type of job they took.

Compared to men, women reported lower levels of overall job satisfaction (57% versus 64%) and were less likely to say they would choose the same type of work again (72% versus 78%) but gender differences were small and non-significant for both measures.

TABLE 35

Overall Job Satisfaction by Match Status and Faculty of Graduation.

	Mismatched	Matched	All
	%	%	%
How satisfied are you with your job?			
Dissatisfied	* 22.2 (35)	7.9 (23)	12.9 (58)
Uncertain	34.2 (54)	23.4 (68)	27.2 (122)
Satisfied	43.7 (69)	68.6 (199)	59.8 (268)
Total	100.0	100.0	100.0 N (448)

	Arts	Bus.	Educ.	Eng.	Sci.	All
Dissatisfied	* 21.6 (24)	18.6 (13)	6.8 (9)	7.8 (5)	9.7 (7)	12.9 (58)
Uncertain	33.3 (37)	22.9 (16)	25.0 (33)	25.0 (16)	29.2 (21)	27.4 (123)
Satisfied	45.0 (50)	58.6 (41)	68.2 (90)	67.2 (43)	61.6 (44)	59.7 (268)
Total	100.0	100.0	100.0	100.0	100.0	100.0

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*Differences between mismatched and matched and faculty of graduation are statistically significant (p<.01, Chi-square test).

TABLE 36

Would Choose the Same Job Again by Match Status and Faculty of Graduation.

(per cent)

If you had the choice to make again would you choose the same type of work you now do?		Mismatched	Matched	All
No	*	39.3 (59)	18.4 (54)	25.5 (113)
Yes		60.7 (91)	81.6 (240)	74.5 (331)
Total		100.0	100.0	100.0

		Arts	Bus.	Educ.	Eng.	Sci.
No	*	36.4 (39)	27.5 (19)	16.4 (22)	21.9 (14)	26.8 (19)
Yes		63.6 (68)	72.5 (50)	83.6 (112)	78.1 (50)	73.2 (52)
Total		100.0	100.0	100.0	100.0	100.0

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*Differences between mismatched and matched and faculty of graduation are statistically significant (p<.01, Chi-square test).

Faculty differences for both measures of job satisfaction are also reported in Tables 35 and 36. On both measures, Engineering and Education graduates reported the highest levels of job satisfaction while graduates with Arts degrees ranked lowest. Business and Science graduates followed behind Education and Engineering graduates. Were Engineering and Education graduates more satisfied with their jobs because rates of match for these faculties were high? Certainly, higher earnings cannot explain the higher job satisfaction among Education graduates, since they reported the lowest average earnings of all graduates. Thus, multivariate analysis is necessary to determine the relative impact of match status on job satisfaction when other variables such as earnings are taken into account.

Regression Analysis of the Effects of Match on Job Satisfaction

A regression equation including the same independent variables as in the equation examining the effects of match on earnings was estimated with job satisfaction as the dependent variable (earnings an independent variable). Education graduates were the reference group for the binary variables designating faculty of graduation, since these respondents had the highest level of job satisfaction.

Results, presented in Table 37, are consistent with the bivariate analysis demonstrating that match status has a significant effect on job satisfaction while gender has no

TABLE 37

Regression Results Predicting the Effects of Match Status, Faculty, Sex and Other Factors on Overall Job Satisfaction

Independent Variables		B	Beta
Match Status 1=match 0=mismatch	*	.323	.155
Employment Status 1=full-time 0=part-time	*	.611	.163
Average Take-home Pay Per Week	*	.001	.164
Sex 1=female 0=male		-.044	-.022
Faculty			
Reference Education=0			
ARTS=1	*	-.370	-.160
BUSINESS=1	*	-.433	-.161
ENGINEERING=1	*	-.408	-.145
SCIENCE=1		-.235	-.087
Local Labour Market Conditions 1=favourable 0=unfavourable		.005	.003
Length of Time in Job 2=over 2 years 1=1-2 years 0=less than 1 year		.001	.001
Constant		2.627	

N =426 Adjusted R^2 =.125

Education was chosen as the faculty reference group since these graduates had the highest average earnings compared to graduates from other faculties.
*Statistically significant (p<.05, T-test).

significant impact. Controlling for other variables in the equation, Engineering, Arts and Business graduates were all significantly less satisfied than Education graduates. While Science graduates were also relatively less satisfied, this coefficient was not significant.

As might be expected, working full-time and having higher earnings both had a significantly positive effect on job satisfaction. Neither labour market conditions nor length of time on the job made a significant difference to job satisfaction ratings. Job satisfaction is influenced by a variety of factors, then, and being in a matched job has about the same net effect as working full-time, and earning more money.

Unfortunately, this regression model explains only 15% of the variance in job satisfaction. However, when other job factors were included,[32] match status and faculty were found to have non-significant effects even though variance explained increased dramatically. This would be expected, given that these differences in job rewards are precisely what underlies debates about underemployment.

Since the purpose of this analysis was to examine the relative effects of match status on job satisfaction scores, theoretically, there was no point in constructing a more complex regression model which omitted match status as a key explanatory variable. However, the relationship between various dimensions of job evaluation and match status will be considered in the following section.

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[32] Other variables included were self-assessments of extrinsic job factors such as job security, physical surroundings, promotional opportunities and skills utilization, as well as intrinsic factors such as interesting work, chance to make decisions, and a sense of accomplishment.

Mismatch and Job Evaluations

The Correlation Between Subjective Measures of Match Status and Job Satisfaction

Before examining differences between the matched and mismatched graduates in the way they evaluate their jobs, it is important to identify which job evaluation criteria are closely associated with job satisfaction, because some of these criteria are also used as subjective measures of underemployment. For instance, respondents' scores on "My job lets me use my skills and abilities" are very strongly correlated with the overall job satisfaction measure (Table 38). Thus, as discussed in Chapter III, skills utilization is a critical aspect of job satisfaction. The extent to which graduates agree that their job is related to their education and training is also correlated, though not as strongly, with job satisfaction. Two other job evaluation measures are highly correlated with job

TABLE 38

Correlations Between Overall Job Satisfaction and Various Job Evaluation Measures.

Job Evaluation Measures:	Job Satisfaction Pearson's r
1) The pay is good	.329
2) I have the freedom to decide what I do in my job.	.414
3) The fringe benefits are good.	.319
4) The job lets me use my skills and abilities	.644
5) The chances for promotion are good.	.383
6) The work is interesting.	.614
7) The physical surroundings are pleasant.	.329
8) The people I work with are friendly and helpful.	.297
9) The job gives me a feeling of accomplishment.	.679
10) My supervisor is very concerned about the welfare of those under him/her.	.392
11) The job gives me a chance to help other people.	.263
12) The job is directly related to my education and training.	.434

r is statistically significant ($p<.01$) for all job evaluation measures.

satisfaction: "The work is interesting" and "The job gives me a feeling of accomplishment."[33]

When subjective evaluations of the job are used as indicators of underemployment, researchers run the risk of confounding specific perceptions of the match between education and the job and overall satisfaction with the job. This does not mean that job evaluation measures should not be used to identify underemployment. Theoretically, the measures reflect conditions of a job which are causally prior to individual evaluations of persons occupying that job.[34] Nevertheless, objective measures are useful for validating job evaluation data in relation to underemployment. Myles and Fawcett (1990) make a similar argument when they use the C.C.D.O. worker trait scores, as well as subjective assessments of overqualification, to evaluate job skills utilization in the service sector relative to other sectors of the Canadian economy.

The Effects of Match Status on Job Evaluation Measures

How does being mismatched affect graduates' evaluations of their jobs? Do matched graduates have substantively better jobs or do they find their work no more interesting and challenging than those who are mismatched?

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[33] These same variables are also the ones most highly correlated with the behavioural intention measure of job satisfaction (would choose the same job again), although the correlations are somewhat smaller (between .43 and .47)

[34] The Quality of Employment Surveys (Quinn and Staines, 1977) use this model of job satisfaction.

The job evaluation criteria used in this study were recoded from five into three response categories, 'Disagree', 'Uncertain', and 'Agree'(Table 39). For 5 out of 13 job factors, mismatched graduates did not perceive their situation any differently than did those who were matched. Both groups had supervisors who were equally concerned about their subordinates and thought they had similar job security. There were small but non-significant differences between the matched and mismatched regarding whether they worked with friendly helpful people, whether their jobs provided good fringe benefits and whether they had the freedom to make decisions.

Thus, autonomy on the job (freedom to make decisions), an important factor in job satisfaction and quality of work (Quinn and Staines, 1977; Karasek, 1979; O'Brien, 1986), is not associated with being matched. This might be expected for graduates with only two years experience. For example engineers and teachers, who are required to work for two years in the profession until they qualify for full membership and permanent certification, are usually closely supervised. Hence, they may not perceive themselves as completely autonomous. The tenuous nature of their professional status may also be the reason why there were no

TABLE 39

Match Status by Job Evaluation Measures, 1987

	Mismatched	Matched	All
	%	%	%
Job Evaluation Measures:			
1) The pay is good			
Disagree	* 38.2	27.6	31.3
	(60)	(82)	(142)
Uncertain	31.2	24.2	26.6
	(49)	(72)	(121)
Agree	30.6	48.1	42.1
	(48)	(143)	(191)
Total	100.0	100.0	100.0
2) I have the freedom to decide what I do in my job.			
Disagree	27.2	19.5	22.2
	(43)	(58)	(101)
Uncertain	22.8	26.3	25.1
	(36)	(78)	(114)
Agree	50.0	54.2	52.7
	(79)	(161)	(240)
Total	100.0	100.0	100.0
3) The fringe benefits are good.			
Disagree	25.9	18.9	21.3
	(41)	(56)	(97)
Uncertain	15.8	15.8	15.8
	(25)	(47)	(72)
Agree	58.2	65.3	62.9
	(92)	(194)	(286)
Total	100.0	100.0	100.0

		Mismatched	Matched	All
		%	%	%
4) The job lets me use my skills and abilities				
Disagree	*	33.5	8.1	16.9
		(53)	(24)	(77)
Uncertain		25.3	14.8	18.5
		(40)	(44)	(84)
Agree		41.1	77.1	64.6
		(65)	(229)	(294)
		----	-----	-----
Total		100.0	100.0	100.0
5) The chances for promotion are good.				
Disagree	*	40.5	31.7	34.8
		(64)	(93)	(157)
Uncertain		19.0	29.7	25.9
		(30)	(87)	(117)
Agree		40.5	38.6	39.2
		(64)	(113)	(177)
		-----	-----	-----
Total		100.0	100.0	100.0
6) The work is interesting.				
Disagree	*	21.5	8.1	12.7
		(34)	(24)	(58)
Uncertain		24.7	14.1	17.8
		(39)	(42)	(81)
Agree		53.8	77.8	69.5
		(85)	(231)	(316)
		----	-----	-----
Total		100.0	100.0	100.0
7) The physical surroundings are pleasant.				
Disagree	*	22.2	14.4	17.1
		(35)	(43)	(78)
Uncertain		29.7	26.2	27.4
		(47)	(78)	(125)
Agree		48.1	59.4	55.5
		(76)	(177)	(252)
		----	-----	-----
Total		100.0	100.0	100.0

	Mismatched	Matched	All
	%	%	%
8) The people I work with are friendly and helpful.			
Disagree	6.3	5.7	5.9
	(10)	(17)	(27)
Uncertain	17.7	12.1	14.0
	(28)	(36)	(64)
Agree	75.9	82.2	80.0
	(120)	(245)	(365)
Total	100.0	100.0	100.0
9) The job gives me a feeling of accomplishment.			
Disagree	* 24.8	8.4	13.8
	(38)	(25)	(63)
Uncertain	25.3	16.8	19.7
	(40)	(50)	(90)
Agree	50.6	74.8	66.4
	(80)	(223)	(303)
Total	100.0	100.0	100.0
10) My supervisor is very concerned about the welfare of those under him/her.			
Disagree	15.5	12.5	13.6
	(24)	(37)	(61)
Uncertain	21.3	25.1	23.8
	(33)	(74)	(107)
Agree	63.2	62.4	62.7
	(98)	(184)	(282)
Total	100.0	100.0	100.0
11) The job gives me a chance to help other people.			
Disagree	* 19.7	12.8	15.2
	(31)	(38)	(69)
Uncertain	28.7	18.8	22.2
	(45)	(56)	(101)
Agree	51.6	68.5	62.6
	(81)	(204)	(285)
Total	100.0	100.0	100.0

	Mismatched	Matched	All
	%	%	%
12) The job is directly related to my education and training.			
Disagree	*57.6	9.4	26.1
	(91)	(28)	(119)
Uncertain	20.3	9.7	13.4
	(32)	(29)	(61)
Agree	22.2	80.9	60.5
	(35)	(241)	(276)
Total	100.0	100.0	100.0
13) The job security is good.			
Disagree	21.5	22.6	22.2
	(34)	(67)	(101)
Uncertain	22.8	20.5	21.3
	(36)	(61)	(97)
Agree	55.7	56.9	56.5
	(88)	(169)	(257)
Total	100.0	100.0	100.0

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*Differences between mismatched and matched groups are statistically significant (p<.05, Chi-square test).

significant differences in the way matched and mismatched graduates viewed their job security.

For the most part, however, mismatched graduates reported lower quality of employment than their matched cohorts. They generally found their surrounding less pleasant and their work less interesting. They had fewer opportunities to help others, and derived less of a sense of accomplishment from their jobs than did the matched group. As reported earlier, the majority of matched graduates thought they utilize their skills and abilities on the job (77%) while only 41% of the mismatched agreed with this statement. There was even greater disagreement on the extent to which the matched perceive their jobs as related to their education and training. Only 22% of the mismatched agreed with this statement compared to 81% of the matched.

There are strong indications, then, that the knowledge, skills and abilities of some post-secondary education graduates (women with less specialized degrees, for example) are not being utilized to full capacity. However, employers often hire new graduates into positions not requiring a degree on the basis of their potential rather than current contributions. Do graduates have similar perceptions of the opportunity for promotion? There is some evidence they do. Asked if chances for promotion from their present job were good, 41% of the mismatch agreed compared to 39% of the matched, even though a larger percentage of the mismatched also disagreed with this statement. However, matched graduates were more uncertain about advancement than their mismatched counterparts. Matched graduates might have been expected to report better promotional opportunities. But, as pointed out earlier, many of these graduates are teachers and engineers who typically experience little upward mobility in their professions particularly in the first two years after entry. Further long-term panel data would be necessary to determine how many of the mismatched are promoted into matched jobs in the later stages of their careers, and how far they advance in the long-run relative to graduates who were matched upon initial labour market entry.

Summary of Job Satisfaction Consequences

Mismatched underemployment generally brought greater job dissatisfaction for this group of graduates. However, once again, faculty selection emerges as a dominant influence in the matching process. Matching and job satisfaction were more closely linked for graduates in Education compared to graduates from other faculties. Surprisingly, match status bore little relationship to job satisfaction for Engineering and Business graduates.

There are important qualitative differences in the way matched and mismatched graduates evaluated their jobs. Overall, the mismatched gave less favourable job evaluations but on a few key variables such as autonomy and freedom to make decisions, there were no significant differences between the two groups. While matched graduates tended to perceive their education as unrelated to their jobs and reported lower levels of skill utilization, they were just as inclined to agree chances for promotion were good. This may be explained by limited opportunities for upward mobility for teachers, in general, and for engineers in entry level positions. The correlation between job evaluation criteria and subjective assessments of job satisfaction is noted but a detailed look at the way graduates view different dimensions of their jobs provides greater insight on the consequences of mismatch. Seemingly this form of underemployment diminishes satisfaction with some, but not all, of the more fulfilling psychological aspects of the job.

Conclusion

These data leave little doubt that mismatched graduates were clearly disadvantaged compared to those who found jobs more commensurate with their level of educational attainment. They earned less money, were generally less satisfied with their jobs, and were more prone to other types of marginal employment such as part-time work and unemployment. Many, particularly women graduates, were working in lower level clerical and sales jobs in the consumer services sector, where it will be difficult to make the move into higher status jobs. However, a considerable proportion of mismatched graduates worked in various other sectors of the economy, including goods producing industries, business services and education, health, and welfare services. In short, there are limited opportunities for graduates to find matched jobs no matter what sector of the economy is considered.

On the other hand, the majority of these graduates, including those from the general Arts and Science faculties, found jobs related to their degree within two years after graduating from university. These data support one of the basic propositions of human capital theory in that graduates choosing more occupationally specific degrees generally reaped higher rewards in occupational status and job satisfaction.

Faculty of graduation had the greatest effect on earnings, while gender and match status had a lesser but significant impact. Thus, individual choices about what kind of degree to pursue led to a great deal of variation in labour market outcomes for graduates with the same level of educational attainment. For instance, Education had the highest rate of match and reported the highest levels of job satisfaction but compared to graduates from other faculties, had the lowest average earnings. Science graduates made more money, on average, than those graduating from faculties with considerably higher rates of matching such Business or Education. They also reported the third highest level of job satisfaction.

Human capital theory is discredited, however, when earnings outcomes for graduates with the same level and kind of educational investments are examined. Women graduates in this study earned less than the men regardless of match status or faculty of graduation. Mismatched female Arts graduates, for instance, earned far less than their male peers, probably because they were hired into jobs where the gap between their educational credentials and job requirements was greater than it was for the types of jobs mismatched Arts males got access to. Although, these data suggest women graduates with professional degrees are as well paid as men entering the labour market with the same credentials, other research findings indicate that pay inequities persist (Leiper and Hunter, 1990; Wannell, 1990).

Overall levels of job satisfaction for both groups of graduates were somewhat lower than might be expected compared to the level of job satisfaction normally reported in the working population as a whole. However, despite the fact that mismatched graduates were significantly less satisfied with their jobs than the matched group, the majority of mismatched graduates said they would choose the same job again.

Finally, there were measurable qualitative differences in the way matched and mismatched respondents evaluate their jobs. Significant differences were found on key dimensions of quality of employment such as the opportunity to utilize skills and abilities, and to derive a sense of accomplishment from one's work. However, mismatched graduates did not necessarily evaluate all aspects of their jobs less favourably than the matched.

In conclusion, comparison of matched and mismatched groups of graduates adds a deeper dimension to the analysis of the consequences of mismatched underemployment. Mismatched graduates, in general, received lower occupational rewards compared to those who were adequately matched. However, the severity of consequences depended on the faculty of graduation, whether graduates were male or female, and the criteria used to evaluate their jobs.

Chapter VIII discusses the theoretical and policy implications of these findings, outlining a program for further research on education-job mismatch.

CHAPTER VIII. DISCUSSION OF FINDINGS: THEORETICAL, POLICY AND RESEARCH IMPLICATIONS.

Introduction

At the core of this study are two basic theoretical questions about inequality in labour market outcomes. One is, "What determines who gets access to preferred jobs"? The other is, "Does our education system provide the individual with a relatively equitable means for realizing human potential and social mobility"? The first chapter of this thesis explains how the problem of mismatched underemployment is related to these important theoretical questions. It reaffirms the significance of education in determining labour market outcomes but also accentuates the importance of changing social and economic structures on opportunities for education-job matching.

The study of underemployment, it is argued, requires a broad analytical framework which incorporates both structural variables (at the societal, institutional and organizational level) and individual variables. Current research must be more thoroughly integrated with studies of changing job skill requirements, educational and occupational status attainment, labour market segmentation; and organizational hiring and human resources utilization practices.

Although this study focuses on individual graduates as a unit of analysis, important structural variables such as labour market conditions and industrial sector are considered. These data confirm the importance of human capital variables in determining match status. Yet they also identify institutional and organizational impediments to skill utilization which are evident in the overall pattern of labour market outcomes. The analytical approach taken tends to bring a more critical perspective to the matching process drawing on the theories of credentialism, deskilling and labour market segmentation.

The purpose of this final chapter is to highlight some of the more important theoretical, methodological and policy implications of this study. It also provides clear direction for future research on underemployment. Returning to some of the general theoretical issues mentioned above, Chapter VIII reviews and discusses the results of the detailed data analysis presented in Chapters VI and VII. A brief summary of findings precedes the discussion of specific research questions.

Summary of Findings

Longitudinal panel data drawn from the Study of Transitions from School to Work, allowed for a more comprehensive analysis of mismatched underemployment than was previously available. Selecting only graduates who chose not to go on for further schooling, those who occupied jobs with a G.E.D. score of 5 or above were considered matched while those in jobs with a G.E.D. score of 4 or lower were identified as mismatched. According to this measure, 35% of the respondents were mismatched two years after graduating with bachelor's degrees. Rates were highest among Arts graduates, followed by those with Science and Business degrees. Few Engineering or Education graduates were underemployed.

Compared to this objective measure of mismatch, 35% of these graduates also said their skills and abilities were underutilized; while close to 40% thought their job was unrelated to their education and training. There was a strong correlation between respondents who were mismatched according to G.E.D. scores and those who indicated underemployment in their response to the subjective measures.

The rate of mismatch improved significantly, but not dramatically, during the first two years after graduation. Though more prone to part-time employment or periods of unemployment, mismatched graduates were just as willing to make a long-term commitment to a job, changing jobs no more frequently than the matched group.

Most matched graduates entered professional and managerial occupations in education, health and welfare, goods producing or business services while most of the mismatched were found in clerical, sales and service occupations. Though many of the underemployed found work in the consumer services industry, others were employed in business services, in the goods producing sector, and in public administration.

Choice of faculty and early career orientation were by far the most important determinants of matching while labour market conditions, socio-economic status, gender and attitudes toward work had little to do with getting a matched job. The effect of academic standing and expectations of match depended on the type of degree acquired, while part-time work during university had no direct impact on match status.

Underemployment had a negative effect on earnings and job satisfaction. While females generally earned less than male graduates, those with degrees in Engineering and Education reported no pay discrepancies. Mismatched women with Arts degrees earned significantly less than their male counterparts. Mismatched graduates were more likely to say they earned less than they deserved, considering their education and training, even though some were making more than matched graduates with the same degrees. Underemployed graduates reported lower levels of general job satisfaction but evaluated some aspects of their work as favourably as the matched group. In fact, mismatched respondents were somewhat more optimistic about their chances for promotion out of their current jobs.

Underemployment, then, is not an entirely negative experience for many of these graduates. Based on a longer-term view of their careers, some were probably where they want to be even though they were technically underemployed. Nevertheless, many were encountering difficulties finding the kind of work they expected to have when they graduated from university. Excluding the Education and Engineering graduates, over half were working in jobs which did not require the level of educational preparation they had acquired.

The implications of these findings, discussed in the following section, are organized around the research questions and hypotheses set out in Chapter IV. The most obvious question arising from these data is, "How serious is the problem of underemployment among university graduates"? Is a mismatch rate of 35% high or low for a group of young labour market entrants with bachelor's degrees?

The Underemployment Rate - What does it mean?

This study finds that 35% of a selected group of respondents, with bachelors degrees from the Universities of Alberta and Toronto, were employed in jobs not requiring their level of educational attainment two years after graduating in 1985.

The rate, in itself, does not necessarily suggest there is a serious problem of underemployment among university graduates in Canada. First of all, these findings cannot be generalized to the population of graduates as a whole. However, since the sample does include respondents from two of Canada's largest universities, including graduates from all major undergraduates faculties, cautious generalization would be acceptable. Also, underemployment was measured for graduates working in both favourable and unfavourable labour market locations.

Nevertheless, underemployment rates are difficult to interpret in the absence of some sort of standard of comparison in the general population. Unfortunately, there are scant Canadian data to refer to even as a rough benchmark. The 1989 General Social Survey indicates 22% of the working population with university degrees are overqualified for their jobs,[35] almost identical to the rate of underemployment in the labour force as a whole (Krahn, forthcoming). Using both the G.E.D. and self-reported measures, Myles and Fawcett (1990) found between 22 and 45% of a 1982-3 national sample of workers were underemployed, depending on the industrial sector where they worked.

Thus, graduates in this study experienced a higher rate of mismatch than the total employed population and those with the same level of educational attainment. However, younger workers in the initial stages of their careers are more prone to underemployment than workers who have been in the labour force for a longer period of time. Presumably, many will find jobs more suitably matched with their educational qualifications as they gain more experience.

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[35] Respondents were asked, "Considering your experience, education and training, do you feel that you are overqualified for your job?"

How does this study compare to other evaluations of labour market outcomes for recent graduates? The estimated rate of mismatch in 1986 was 39%. This rate is higher, but not entirely out of line, with results from other Canadian studies surveying graduates 6 months to a year after getting their degrees. Twenty-nine percent of respondents with bachelor's degrees in the 1984 National Survey of Canadian graduates said their jobs did not require a degree (Clark et al., 1986:7) whereas the 1978 National Survey had estimated underemployment among this group to be about 38% (Clark and Zsigmond, 1981:162). The 1986 survey of Ontario graduates, reported 35% of the 3 year B.A.s were mismatched compared to 26% of those from the 4-year B.A. program (Denton et. al., 1987:202). All of these studies relied on subjective reports of whether or not a degree was required for the job rather than an objective measure of job skill requirements such as the G.E.D. score.

Ultimately, one has to assess mismatch in the broader context of changing job skill requirements, levels of educational attainment, and hiring standards for occupational entry. An underemployment rate of 35%, however, seems high in view of the supposed labour shortage for "educated" workers (Canadian Chamber of Commerce, 1988:24; Canada; 1989:9). These data imply that employers are probably underestimating the skills and abilities of the current youth labour force.

Discussion of the Causes and Consequences of Mismatched Underemployment

By systematically comparing labour market outcomes for a group of matched and mismatched university graduates, this study is able to draw pivotal conclusions about the causes and consequences of mismatched underemployment. Various questions left unresolved in the existing literature were pursued in the empirical analyses presented in Chapters VI and VII. Is evidence of growing underemployment among university graduates merely a problem of improper measurement? Do subjective measures overestimate mismatch? How do graduates' expectations affect their perceptions of mismatch? Do variations in local labour market conditions have a significant effect on the rate of mismatch among university graduates? Is mismatch a normal part of the labour market adjustment period for young graduates? To what extent do ascribed characteristics such as gender, socio-economic status and age influence matching? How do choices about what kind of degree to acquire affect the probability of being matched? Are mismatched graduates underemployed because they are less committed to the work force, less achievement-oriented, or less capable academically than those who are matched?

The Measurement Issue

The problem of how to measure underemployment is an ongoing point of contention among researchers as discussed in Chapter III. This study finds little evidence that subjective measures of mismatch produce inflated estimates of underemployment (Clogg, 1984:240; Burris, 1983:457). There is a moderate, significant correlation between the two subjective indicators of mismatch and the objective measure used in this study. Estimates of mismatch based on relatedness of education and skills utilization are marginally higher than the estimate derived from G.E.D. scores.

Differences between subjective and objective mismatch varied by faculty and gender. Graduates from Education, Engineering and Business rated the education-job mismatch somewhat more critically on the subjective measures, while the Arts and Science graduates evaluated match more positively compared to their objectively measured rate. Subjective rates were equal to objective rates of mismatch among women, but higher on one indicator (job related to education and training) for male graduates, probably reflecting the way engineers perceived their jobs.

These findings, along with other studies (Clark and Zsigmond, 1981; Clark et. al., 1986; Myles and Fawcett, 1990) clearly indicate that subjective measures of mismatch do not grossly exaggerate underemployment. However, it is important to have an objective indicator of job skill requirements as a basis for comparing results achieved by self-report measures (Myles and Fawcett, 1990). In short, although evidence of rising levels of educational-job mismatch must be carefully evaluated, the problem of underemployment among university graduates is not simply an artifact of measurement.

Mismatch as a Temporary Phase in the Transition from School to Work.

The rate of mismatch declined somewhat between May 1986 and May 1987 with one-quarter of these graduates finding a better job. Judging from studies of underemployment among different age cohorts, the rate of mismatch will probably decline further as these graduates age (Clogg, 1979; Clogg and Shockey, 1984).

Regardless, a third of these graduates remained underemployed two years after leaving university and a considerable number of them entered such low level occupations that movement into the professional managerial stream is going to be difficult. Many will pursue further education but others face an uphill struggle over the next few years to improve their labour market position. Social mobility research indicates education qualifications have less impact on occupational attainment the longer graduates remain out of school (Jones, 1985:137). Hence, this group should be targeted for qualitative analysis to provide further insight on the experience of underemployment and problems of moving into upper labour market segments.

Mismatched graduates may find their attitudes toward work, level of actual or perceived skill development, and even their personality traits negatively affected by their early job experience. Research by Kohn and Schooler (1983) on the effects of job complexity and autonomy on personality and career outcomes would be a useful theoretical base for such research (see also Spenner and Otto, 1987).

Labour Market Conditions and Mismatch

An asset of the Transitions from School to Work Study data was the ability to compare match status for graduates entering different local labour markets. Under fairly rigorous investigation, local labour market conditions (the unemployment rate) failed to increase the probability of mismatch. It was suggested this might have something to do with local or regional variations in industrial structure affecting the temporary supply-demand ratio for matched jobs.

In fact there were significant differences between local labour markets. For example, business services accounted for a greater share of employment for graduates working in Toronto while the percentage of education, health and welfare, and public administration jobs was comparatively higher in Edmonton. One might speculate that sales or management jobs not requiring degrees may have attracted graduates entering the Toronto labour market between 1985-7 by offering unusually high earnings. Alternatively, public sector employment in Edmonton had weathered the recession fairly well compared to the city's resource dependent private sector.

Whatever the reasons, the fact that underemployment exists under conditions of severe labour shortages emphasizes the need to include measures of this phenomenon as a key dimension of labour market analysis (Sullivan, 1978:1-12; Blakely and Harvey, 1988:36). It also suggests that human capital theory, with its emphasis on general labour market conditions and supply-demand ratios, is limited in its ability to explain underemployment.

The Effects of Gender, Socio-economic Status and Age on Mismatch

This study provides fairly conclusive evidence that gender had no significant effect on whether graduates were matched or mismatched, nor did it demonstrate any impact on subjective perceptions of underemployment. Regardless of faculty of graduation, women in this study were at no greater risk of being mismatched compared to men. However, there was clearly a difference in the degree to which females graduates were mismatched compared to their male counterparts. Generally mismatched women were in lower status clerical jobs while mismatched males occupied sales jobs with higher G.E.D. The majority of matched women entered the teaching profession while matched men were predominantly in science, engineering or managerial occupations.

As previous research has shown, gender has an antecedant effect on matching prior to the point of university entrance. However, the sex-segregated structure of the labour market continues to affect women even after they graduate since women with less occupationally oriented degrees tend to be more severely underemployed compared to men with the same qualifications.

Socio-economic status also had no significant effect on matching once these graduates entered the university stream. Although Burris (1983) reported that, at all levels of educational attainment, people from working class backgrounds were more likely to be underemployed (458), these data fail to demonstrate any significant relationship between various measures of socio-economic status and mismatched underemployment.

Though limited by the age parameters of this particular sample, age had no significant effect on which graduates became underemployed. Among graduates with equal length of labour market experience, those 25-30 years of age were no more likely to be mismatched than younger graduates. Thus, age or maturity are less important than credentials in determining which graduates become underemployed. This might be expected in a relatively young age cohort, whereas age may override the importance of skills or credentials where older workers are concerned.

Ascribed characteristics such as gender, S.E.S., and age, then, have little effect on match outcomes once faculty of graduation is taken into account. Gender inequality, however, is evident among mismatched Arts graduates, suggesting that women continue to face barriers to higher status jobs particularly when formal qualifications play a less determinant role in occupational entry.

Faculty of Graduation and Mismatch.

Certainly faculty of graduation is the best predictor of matching for both male and female graduates. Those with less specialized degrees were at a distinct disadvantage in finding jobs which match their level of educational attainment. The average Engineering graduate was twice as likely to be matched compared to an Arts graduate while those with Business or Science degrees had a 1.5 greater probability of being matched.

Though a baccalaureate degree signals entry into specific professional occupations for some, it merely puts others slightly ahead in the queue for jobs requiring a lower level of educational attainment. Evidently the need for highly educated workers, predicted by post-industrialists and the information society scenarios, applies only to those with certain types of credentials. These data suggest there are discrepancies between what employers say they need and the types of jobs graduates are getting.

For instance, while employers complain about a shortage of skilled scientists, 45% of the Science graduates in this study were underemployed, 42% said their jobs were not related to their education and training, and 30% reported that their skills and abilities were not being utilized on the job. This may be explained by a discrepancy between the types of science courses taken by these graduates (eg. life sciences versus physical sciences) and the type of scientific jobs available. If so, there must be more emphasis on defining specific job skill requirements enabling university curriculum planners and students to design course programs more closely aligned with labour market demand.

Improved information about job skill requirements may not be the only answer to mismatch. Employers also have a responsibility to consider the transferability of knowledge and skills among various disciplines. This not only applies to science trained graduates but to those from other faculties as well. For instance, employers may be underestimating the importance of a humanities or social science background in preparing young people for administrative and management roles (Evers et al., 1991). Arts graduates are obviously equally as capable for many of the positions business graduates occupy since many gain access to the same jobs.

This suggests general skills and abilities are more relevant than specific job-skill requirements even though, as credentialists suggest, employers may prefer graduates with a business school degree for other reasons. Business graduates may be aware of this as they enter the workforce. Over 40% viewed themselves as underemployed in relation to skills utilization or general relatedness of their education and training.

Thus while pursuing an Education or Engineering degree practically guarantees entry into these professions, it is less evident how or why other types of degrees signal job or occupational suitability. Moreover, these data suggest a need for closer scrutiny of employer job entry requirements.

Academic Performance and Mismatch

Overall, graduates with above average grade-point scores were significantly more likely to be matched. While higher marks gave a competitive edge to those with Education and Science degrees, the effect was non-significant for

Engineering, Business and Arts graduates. If marks are considered a measure of intelligence or ability why do they not have a similar effect across all faculties?

From a human capitalist perspective, one might expect marks to indicate skills competency, especially for those with professional degrees. In other words, for graduates with educational preparation more specifically related to occupational requirements, higher marks would signal those best able to do the job (Gottfredson, 1985). However, these data imply no such relationship between marks and specialized versus general degrees. Academic standing is relevant to matching but not necessarily as indicator of specific skills competency.

The supply of graduates, their area of specialization, occupational demand, professional entry requirements, and recruitment and hiring practices for different industries and employers would all have an effect on the way marks are used to screen graduates. For instance, education boards may have relied more heavily on marks to screen 1985 graduates since fewer jobs were available for this cohort. On the other hand, though few graduates were hired as scientists, their jobs would likely emphasize research thus making academic performance more relevant to the job screening process. This is speculation, of course, since further analysis would be required to determine exactly how and why various employers hired these graduates for different types of jobs.

Work Attitudes, Expectations and Matching

These data indicate that attitudes and expectations have little bearing on who gets a matched job and who doesn't. Measures of achievement motivation and work ethic had no significant impact on match outcomes, nor, in the final analysis, did readiness for a long-term commitment to a job or feelings of job entitlement.

Were these graduates underemployed because tended to change jobs more frequently, as youth supposedly often do (Osterman, 1980)? The sample selected for this study includes those who did not go back for further schooling, which in itself suggests a greater commitment to the workforce. However, during the years following graduation mismatched respondents held the same number of jobs as the matched group.

Job-hopping and long periods of unemployment, then, were not evident among this particular group of underemployed graduates. In fact, mismatched graduates were more susceptible to being laid off or terminated due to temporary employment rather than leaving their jobs voluntarily. This attests to the quality of jobs these graduates were able to find rather than a tendency to be too choosy about the kind of job they would take.

Those who reported a stronger career or job orientation toward their education were less likely to be mismatched no matter which faculty they chose to enter. Yet, even those who pursued Engineering and Education degrees were motivated by both interest and career objectives. Only 1% of these graduates admitted to selecting their faculty of education for the prestige or remuneration a degree might offer even though some see this as an explanation for escalating levels of educational attainment in North America (Smith, 1986:98).

Few graduates overestimated the probability of match at the time of graduation, although those who predicted match and failed to achieve it were more inclined to perceive themselves as underemployed. No doubt, social norms about the appropriate level of occupation for those with a university degree influence perceptions of mismatch, as V. Burris suggests (1983:464-65). However, the respondents in this study evaluated their situation based on concrete and substantial job experience.

Early definition of career goals and a realistic assessment of match probabilities may dissuade some students from pursuing a university education or choosing less occupationally-oriented degrees. For graduates from all faculties, however, general interest in a subject area is often equally or more important than a specific occupational destination.

Working While in University

Graduates are often encouraged to find summer and part-time jobs related to their degrees in order to enhance their future employment prospects (Edmonton Journal, June 17, 1991). These data show, however, that part-time work experience has little effect of subsequent match outcomes.

The majority of graduates in this study worked part-time during the last 9 months of their degree program. Graduates from Arts were far more inclined to combine work and school, compared to Engineering graduates, for example. Yet within each faculty of graduation, working part-time made no significant difference to subsequent match status. Working while in school neither improved nor diminished the probability of getting a matched job after graduation, likely due to the peripheral nature of part-time or summer student employment. This concurs with earlier analysis of Study of Transitions from School to Work data showing part-time employment has a negligible effect on later employment outcomes for both high school and university graduates (Lowe and Krahn, forthcoming).

Mismatch and Service Sector Employment

This study emphasizes key qualitative differences in the types of jobs occupied by matched and mismatched graduates. In identifying differences in job outcomes, additional structural explanations of underemployment are considered. For instance, is mismatch on the rise due to increasing proportions of service sector jobs in the Canadian economy? Do matched graduates tend to enter jobs in the education, health, business and professional services while mismatched graduates are largely confined to jobs in the lower-tier of the service sector?

The later hypothesis holds true for the matched graduates but while 30% of mismatched graduates were employed in consumer and personal services, the rest were spread across various industries including the business services, goods producing and public administration sectors.

One could make a fairly accurate prediction of match or mismatch, then, by knowing a graduate in this sample worked in the education, health and welfare service sector, or in consumer services. However, the goods producing, business services and public sector employment, usually noted as providing higher quality jobs compared to consumer services, also provided a substantial proportion of poorer quality jobs at least in terms of matching educational attainment with job requirements. A bifurcation in service sector jobs is evident, as Myles (1988:346) suggests, but 'bad' jobs, in this case mismatched jobs, are spread across various sectors of the service and other industries.

A recent report on non-standard work (self-employment, part-time, seasonal etc.) found significant pockets of this type of employment in some of the upper-tier service industries (Krahn, forthcoming). Thus, concerns about monitoring the quality of employment should not be limited to the so called lower-tier of the service sector.

Labour Market Segmentation and Underutilization of Skills

The detailed job profiles for matched and mismatched respondents with different types of degrees (Table 6-26) indicates the degree of stratification in the labour market for university graduates. Average Blishen scores between matched and mismatched groups vary significantly. Sixty per cent of mismatched graduates were in clerical, sales and service occupations while the majority of the matched entered the professions of teaching and engineering. Few underemployed graduates were found in blue-collar jobs. Typically, mismatched males worked in sales while females occupied lower level clerical jobs.

Only a handful of graduates were severely underemployed, working as taxi drivers, labourers or waiting on tables. For the most part, mismatched graduates were employed as bookkeepers, office managers, secretaries, sales or advertising representatives, administrators, restaurant managers, and technicians. In other words, they occupied the kind of jobs many high school or community college graduates are qualified for. There may be a gradual encroachment of overqualified people in these occupations, forcing those with less schooling to take the growing number of low skill, low status service sector jobs. Current projections suggest there will be shortages of labour in personal services and the retail trade industries responsible for creating such jobs (Canada, 1989:5-6). This may improve wages and job security in these sectors, but the problem of barriers to industrial sector and occupational mobility, raised by dual labour market theorists, would likely remain. Hence, there is a need to monitor the potential for polarization between jobs occupied by young people with different levels of educational attainment. The extent and degree of underemployment among university graduates has serious implications for labour market entrants with lower levels of educational attainment (Smith, 1986:95; Blossfeld, 1990:165; Krahn,1991).

The job profiles for this group of graduates also suggest the skills and abilities of university graduates are underutilized. While employers complain about skill shortages, why are university graduates relegated to jobs requiring no more than a high school education? Rather than blaming the education system for the shortage of scientific and management skills (Canadian Chamber of Commerce, 1988:29), these data suggest that employers could make better use of available skills by providing graduates with less specialized degrees (particularly women) with on-the-job training and development opportunities.

Mismatch and Graduates' Earnings

Matched graduates in this sample generally earned more than those who were mismatched depending on the faculty of graduation or the industrial sector where they were employed. Being matched or choosing a professional degree did not always translate into higher earnings for these graduates. For instance, those with Science degrees had the second highest rate of mismatch; yet, controlling for match status, gender and other variables these graduates did relatively better than Arts, Business and Education graduates. Matched jobs also brought little advantage to Arts or Business graduates, while they made a significant difference to earnings for Engineering and Education graduates. This is interesting in view of the fact that occupations in Engineering and Education are highly organized professions which make use of credentials to restrict entry.

Industrial sector location also had a powerful effect on earnings. Graduates in the goods producing sector had the highest relative earnings; while, regardless of faculty of graduation, gender or match status, those employed in consumer services had the lowest earnings of all graduates. In fact, service sector employment brought lower earnings for graduates even if they had degrees in business or worked in the business or professional services.

More importantly, gender differences figure prominently in this analysis. Women graduates, whether matched or mismatched, earned significantly less than male graduates with the same qualifications, though women who chose specialized degrees in Engineering, Business and Education were less vulnerable to pay discrimination. Myles and Fawcett (1990) propose this is due to the formalization of credential requirements for these type of occupations. It may also reflect the willingness of employers to hire graduate women for low paying clerical work or the tendency for women to fall back on traditional "womens' work" when they encounter barriers to accessing higher status jobs. On the other hand, some mismatched male graduates earn more than matched graduates by accessing relatively high paying non-professional managerial and sales jobs (Shockey, 1989), while mismatched females tend to be clustered in lower level clerical and sales jobs.

As Rumberger (1987) concludes, the relationship between underemployment and income is much more complex than human capital theory implies. Wide earnings discrepancies exist, then, among graduates with the same level of investment in education and even those with the same kind of degrees. These differences seem to have less to do with utilization of skills and abilities, productivity, or trainability and more to do with market and structural forces influencing pay levels for the various occupational streams chosen by these graduates.

Mismatch and Job Satisfaction

If these graduates suffered additional negative consequences from being underemployed, research suggests it might be evident in lower job satisfaction (Burris, V. 1983:460). For general measures of job satisfaction this hypothesis is supported, but mismatched graduates do not rate all aspects of their jobs less favourably than those who are matched. They find their work less interesting and derive less of a sense of accomplishment from their jobs but report no significant differences in job security or the freedom to make decisions, despite the fact that most said they were not utilizing their skills and abilities. Moreover, mismatched graduates were more inclined to say chances of promotion were good. They may be in training positions or waiting for senior positions to be vacated. Alternatively, their optimism may stem from age and inexperience. Unlike older workers, they have not had enough time to adjust their job expectations downward.

A plausible explanation for the ambiguity in job satisfaction may well be that many graduates were not highly overqualified for their jobs. As Burris concludes, there is no evidence that moderate discrepancies between educational attainment and occupational requirements are linked with high levels of job dissatisfaction (1983:461).

Nevertheless those in jobs not requiring a degree reported being less satisfied with their pay even though many were making more than matched graduates. Assessments of "earning what one deserves", though, may have less to do with being matched and more to do with making a specific career choice and knowing what level of pay to expect. For instance, those with Education degrees were the poorest paid of all graduates yet two years after entering this profession, most agreed they were earning what they deserved (partly a reflection of unionized pay scales). The majority of Arts and Business graduates said they were underpaid relative to their education, while Science and Engineering graduates thought their remuneration was fair.

In sum, mismatched graduates earned less money and were generally less satisfied with their jobs compared to those in matched jobs. Matched graduates found their jobs more interesting and derived a greater sense of accomplishment from their work, but evaluated other aspects of their jobs no more favourably than mismatched graduates. Thus, underemployment, though clearly a disadvantage to most graduates, is not an entirely negative experience probably due to the fact that some are only moderately mismatched or underemployed by choice.

Further analysis and longer-term data would be required to determine if these graduates had a tendency to blame the system or themselves for their fate (Burris, V. 1983:465); or if underemployment has a detrimental effect on later career developments. Research suggests initial labour market experience in low skill, low challenge jobs has a negative impact on skill development and attitudes toward work (Kohn and Schooler, 1983; O'Brien, 1986:62-64). It also affects individual and organizational perceptions of competence (Wanous, 1980). Hence, underemployment may have long-term effects on graduates even after they move into matched jobs.

Theoretical and Policy Implications

This study has produced numerous conclusive findings about mismatched underemployment among university graduates. These results shed light on, but cannot resolve, some of the larger theoretical debates about credentialism, deskilling, education and inequality, or organizational structures and hiring practices discussed in Chapter II. There are, however, some direct implications pertaining to occupational or status attainment and the notion of technical rationality which supposedly links the education system with the labour market.

Human capital theorists have emphasized the importance of individual skills and abilities and educational choices in determining labour market outcomes. Higher rewards, they say, are given to those who choose occupations which perform functions more critical to society and require skills which are more difficult to acquire. High levels of unemployment and underemployment among youth during the last three decades are attributed to periods of low economic growth as well as an oversupply of graduates due to baby boomers passing through the education system.

This study reveals how tenuous these assumptions are when you look more closely at the problem of underemployment among university graduates. On the surface, the findings discussed in Chapters VI and VII seem to support the basic theoretical premise of human capital theory. Graduates with occupationally-oriented degrees are certainly more assured of getting a job which matches their level of educational attainment. There are even some indications that those who have higher marks in university are least likely to join the ranks of underemployed graduates. Yet when differences in match status, earnings and job satisfaction are examined for male and female graduates with different kinds of degrees, a more complex pattern of matching emerges.

Having a university degree is not sufficient to gain access to a job requiring the same level of educational attainment. This is not because some graduates expect too much, are less achievement-oriented, or are not ready to commit to a full-time job. Nor is it due to students coming from lower socio-economic backgrounds, or women being less successful in finding a matched job. Faculty of graduation has a tremendous influence over whether or not a graduate becomes underemployed, but so does the structure of labour market opportunity.

Unless students choose a professional degree such as Education or Engineering, the chances of making a match are not much better than 50%. Otherwise, jobs requiring a university degree are not plentiful. Fewer matched graduates in this study found jobs in business, science, the social sciences or humanities occupations. This was evident, regardless of the overall demand for labour in the areas where these graduates worked. Those located in a city like Toronto, which had a booming economy and low unemployment at the time they were surveyed, were just as likely to be mismatched as graduates flogging their credentials in cities with few job opportunities.

Thus, despite the present hue and cry over skilled labour shortages, there are only so many jobs available for young people with university degrees. A considerable number of graduates, particulary those with Arts degrees, are working in clerical sales and service jobs in the lower paying consumer services sector. Underemployed graduates are also found in the so called 'upper-tier' of the services sector (professional and business services, education, health and welfare, or public administration). Thus, continued growth in these sectors of the service economy may not necessary lead to greater demand for those with higher educational qualifications as the post-industrialists or information society theorists predict.

Changing industrial structures and job skill requirements are not the only reason why university graduates are underemployed. The results of this study indicate that the existing pool of graduates is probably better prepared for labour force entry than many employers assume. There is a gap between what employers say they need and actual labour market outcomes for recent graduates. For instance, why are 45% of the Science graduates in this study underemployed if there is a shortage of people with scientific training? Why do some Arts, Science and Business graduates end up in the same types of jobs, if specialized training is do important? Furthermore, why do more than one-third of the graduates in matched jobs say they are not using their skills and abilities two years after entering the labour market?

Employers claim that university graduates lack the kind of skills required in today's labour market (Canadian Chamber of Commerce, 1988:29,38). If so, they must take the initiative to identify what specific skills are required so that students can make more informed decisions in selecting degree programs. Canadian employers could also provide more in the way of on-the-job training to supplement knowledge and skills gained through general educational preparation.

There are other areas where educated labour could be better utilized. This study leaves no doubt that gender segregation prevails, even among those with higher levels of educational attainment. Women continue to choose Arts and Education degrees, which tend to lead them into occupations with lower pay and limited opportunities for promotion. Employers and educators must do more to attract women into science and engineering occupations to break this traditional pattern.

Obviously, some graduates would benefit from improved job counselling prior to making a choice about what kind of university program to choose. However, universities must also take greater responsibility for offering programs which are more flexible in content. That is, students should be given greater opportunity to supplement their basic degree program with courses from other faculties which may be more job relevant. For instance, Arts and Science students should be allowed to take courses in Business or Education, if they have an interest in these areas, or think it may help them get a better job. In many cases, courses in the social sciences and humanities are helping students to develop the very skills employers say are critical for managerial and professional jobs eg., written and verbal communications, knowledge of human behaviour, creative/conceptual thinking

(Evers et. al., 1991). Yet these skills are not formally recognized by employers or universities as being immediately job relevant.

Despite evidence that underemployment continues to affect university graduates, it is argued that this problem has minimal social consequences (Smith, 1986). Granted, there has been no widespread protest or political dissent. Findings reported in Chapter VII, however, document significant qualitative differences in earnings and job satisfaction between matched and mismatched jobs and the way they were perceived by graduates. Some were more severely underemployed compared to others. Few graduates were in blue collar jobs but many women graduates worked in low level clerical or sales jobs, where they were paid considerably less than mismatched males. There was considerable inequality, then, among those with same level and kind of educational attainment. On the other hand, some mismatched graduates were quite happy with their jobs, while others moved into matched jobs between the first and second year after entering the labour market.

Mismatched underemployment may not be a grave social problem but it does have some serious long-term implications if present trends continue. Those with lower levels of educational attainment may find access to higher status clerical or managerial administrative jobs blocked by requirements for formal credentials, or by having to compete with university graduates for these jobs.

By the same token, as more and more university graduates return for further education, jobs previously accessible with a bachelor's degree (e.g., social worker, geologist, economist) may in future be obtained only by those with master's degrees. Hence, Randall Collins' (1979) vision of the credential society, in which formal educational requirements are raised to the point where they bear little relationship to technical job skill demands, may not be out of the realm of possibility.

Contrary to one of the major predictions of human capital theory, demand for university education has not declined in the face of lower birth rates or diminished returns for previous graduates. This will likely lead to increased stratification in the labour market for university graduates, making it even more important to identify who gets access to better quality jobs and why.

Mismatch should also be monitored as part of the ongoing debate about changing economic structures, technology, and the nature and organization of work. This will be difficult without an independent, valid measure of job skill requirements. Employment and Immigration Canada, or a relevant federal agency, should either revise the existing worker-trait data in the C.C.D.O. or develop new methods of evaluating job skill requirements.

Directions for Future Research

This study identifies several areas where further research on mismatch would be useful. First of all, respondents in this sample should be surveyed periodically so that their long-term career patterns can be monitored. These data show the rate of mismatch declined slightly between the first and second year after graduation. Has mismatch become less of a problem over time? Presumably some graduates will be successful in obtaining matched jobs as they gain on the job experience and training. However, considering the rate of mismatch in the overall working population as well as university graduates as a whole, it is likely that, at best, approximately 20% will remain underemployed. Fortunately, the Transitions from School to Work Study received funding for an additional follow-up survey in 1989. Although the data were not available in time for this study, it is now possible to determine what respondents were doing four years after graduation.

Another reason why additional follow-up data on this group of graduates would be useful is for examining the long-term effects of being underemployed in the early stages of one's career. Getting off to a poor start may create difficulties in moving up the occupational hierarchy, especially for women in clerical jobs (Blossfeld, 1987). The longer these women stay in clerical jobs, employers will be less likely to consider them for managerial or professional jobs unless they return for additional education credentials.

Since rates of mismatch among university graduates must be assessed in relative terms, comparative data on subsequent graduate cohorts as well as those with lower levels of educational attainment is crucial. If more and more graduates are hired for jobs not requiring degrees, what kinds of jobs are future graduates with high school and community college degrees going to get? Nevertheless, the possibility that the declining birth rate will eventually alleviate problems of underemployment cannot be discounted.

A second area for further research focuses on the institutional and organizational level of analysis. We need to know more about organizational hiring, training and career development practices and how they affect opportunities for matching. These data suggest that employer biases in matching graduates to jobs may be an impediment to more effective skill utilization. This is evident not only in different occupational and earnings outcomes for male and female graduates, but also in the kinds of jobs graduates with Arts and Science degrees are hired for. In addition, there are inconsistencies in the way academic achievement affects match status for graduates with different types of degrees. This implies that employers do not necessarily use marks as an indicator of technical skills competency or ability. Equally as important is research on what influences educational and occupational choices before young people reach university. Why is it that women continue to choose faculties which will lead them into jobs traditionally held by women?

A third research priority would be to examine the psychological consequences of mismatch. Is there evidence that graduates become disillusioned with the education system and its failure to deliver a better job? Do graduates who experience underemployment suffer as far as individual self-esteem and attitudes toward work are concerned?

Finally, the most important area for future research is to develop more effective measures of skill. Researchers have identified the shortcomings of current methods of relating formal schooling to job skill requirements. Though updating the current worker trait data in the C.C.D.O. would be a costly undertaking, it must be done particularly in light of the growing problem of skill shortages (Canada, 1989:24).

In conclusion, academics would be remiss to ignore the theoretical significance of mismatched underemployment and its value as an important indicator of social inequality and changing quality of employment. Employers, educators and policy makers must be made aware of this problem, and respond with greater awareness of how their decisions affect the education-job matching process and the overall quality of life for present and future labour market participants.

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APPENDIX 1

Levels of General Educational Development

Level	Reasoning Development	Mathematical Development	Language Development
6	Apply principles of logical or scientific thinking to a wide range of intellectual and practical problems. Deal with non-verbal symbolism (formulas, scientific equations, graphs, musical notes, etc.) in its most difficult phases. Deal with a variety of abstract and concrete variables. Apprehend the most abstruse classes of concepts.	Apply knowledge of advanced mathematical and statistical techniques such as differential and integral calculus, factor analysis, and probability determination, or work with a wide variety of theoretical mathematical concepts and make original applications of mathematical procedures, as in empirical and differential equations.	Comprehension and expression of a level to - Report, write, or edit articles for such publications as newspapers, magazines, and technical or scientific journals. Prepare and draw up deeds, leases, wills, mortgages, and contracts. - Interview, counsel, or advise such people as students, clients, or patients, in such matters as welfare eligibility, vocational rehabilitation, mental hygiene or marital relations.
5	Apply principles of logical or scientific thinking to define problems, collect data, establish facts and draw valid conclusions.		

	Interpret an extensive variety of technical instructions, in books, manuals, and mathematical or diagrammatic form. Deal with several abstract and concrete variables.		- Evaluate engineering technical data to design buildings and bridges.
4	Apply principles of rational systems to solve practical problems and deal with a variety of concrete variables in situation where only limited standardization exists. Examples of 'principles of rational systems' are: Bookkeeping, internal combustion engines, electric wiring systems, house building, nursing, farm management, ship sailing. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.	Perform ordinary arithmetic, algebraic and geometric procedures in standard, practical applications.	Comprehension and expression of a level to - Transcribe dictation, make appointments for executive and handle his/her personal mail, interview and screen people wishing to speak to him/her, and write routine correspondence on own initiative. - Interview job applicants to determine work best suited for their abilities and experience, and contact employers to interest them in services of agency. - Interpret technical manuals as well as drawings and specifications, such as layouts, blueprints and schematics.

3	Apply common sense understanding to carry out instructions furnished in written, oral, or diagrammatic form. Deal with problems involving severe concrete variables in or from standardized situations.	Make arithmetic calculations involving fractions, decimals and percentages.	Comprehension and expression of a level to - File, post and mail such materials as forms, cheques, receipts, and bills. - Copy data from one record to another, fill in report forms, and type all work from rough draft or corrected copy. - Interview members of household to obtain such information as age, occupation, and number of children, to be used as data for surveys, or economic studies. - Guide people on tours through historical or public buildings, describing such features as size, value and points of interest.
2	Apply common sense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.	Use arithmetic to add, subtract, multiply, and divide whole numbers.	

1	Apply common sense understanding to carry out simple one- or two-step instructions. Deal with standardized situations with occasional or no variables in or from these situations encountered on the job.	Perform simple addition and subtraction, reading and copy of figures, or counting and recording.	Comprehension and expression of a level to - Learn job duties from oral instructions or demonstration. - Write identifying information, such as name and address of customer, weight, number, or type of product, on tags, or slips. - Request orally, or in writing, such supplies as linen, soap, or work materials.

SOURCE: Canada, Canadian Classification and Dictionary of Occupations, Volume 1 (Ottawa: Department of Manpower and Immigration), pp. 1161-2.